The role of high schools in introductory occupational safety education – Teacher perspectives on effectiveness

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ABSTRACT

High school-based introductory occupational safety education has become common and serves an important role in preparing students for entry into the workforce. However, the practices and perspectives of teachers have received limited attention. We sought to gather empirical data from high schools in South Australia and examine potential predictors of effective safety education.

Focus groups and interviews with teachers and *school to work* advisors were undertaken and a questionnaire survey of teachers conducted. Potential predictors of perceived effective learning were grouped in terms of teacher-, school- and teaching-related characteristics.

Of the 156 respondents from 103 schools, 16% had received no formal safety training, 86% felt that the school management was supportive, and 36% felt that their ability to teach the topic effectively was compromised due to other demands of their role. Although general learning guidelines were available, there was variability in the time spent, teaching methods and resources used. In a multivariate model, perceived student engagement was significantly associated with the use of case studies (adjusted odds ratio = 2.2). The teaching of occupational safety in high schools would benefit by a standardized yet engaging approach, incorporating case studies. In-service teacher training with more explicit guidance on effective content and delivery is recommended.

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1. Introduction

Young workers (15–24 yrs old) have a disproportionately high rate of injuries in the workplace and many are employed on a casual, temporary or intermittent basis, in jobs that require low technical skill (Thamrin et al., 2010). One approach to reducing the burden of young worker injury is through improvements in the provision and effectiveness of safety training, initially at school and then in the workplace. The value of school-based introductory safety training can be inferred from a study in Canada which found that only one in five employees had received safety training in their first year with a new employer (Smith and Mustard, 2007). In an Australian survey of 270 workplaces in the hospitality industry, the need for improvement in induction training for young workers was highlighted (Hicks, 2009). Indeed, the importance of providing occupational safety education in the secondary school setting has been widely recognized (Davis and Pollack, 1995; U.S. Department of Health and Human Services, 1995; NIOSH, 1999; Schulte et al., 2005).

To improve school-based education, consistency and effectiveness are two aspects that have been identified as requiring further attention. A report for the European Agency for Safety and Health at Work revealed inconsistency in approaches to occupational safety education, both between and within member states (Sas, 2009). It has been argued that, the quantity and quality of occupational safety education is largely at the discretion of the instructor and school (Sas, 2009; Salminen and Palukka, 2007; Schulte et al., 2005). The quality of education may be influenced by the teacher's enthusiasm and experience, the availability of time and resources, and the level of engagement of the students themselves (Burke et al., 2006).

Internationally, there is a vast quantity of occupational safety information and resources, including those specifically for high school students. However, there appears to be limited evidence for the effectiveness of the resources or programs.

While there is evidence that school-based educational programs have the potential to increase knowledge about safety (Lerman et al., 1998; Linker et al., 2005), it cannot be assumed that this knowledge will translate to safe behavior and ultimately, injury reduction. A recent analysis of workplace safety education initiatives for young workers in Canada described current approaches as informational rather than instructional. Specifically, it was

suggested that current programs largely fail to promote self-advocacy, considered a critical factor in enabling safety knowledge to be put into practice (Chin et al., 2010).

Thus, there is a need for more research focussed on attaining a better understanding of how school-based occupational safety education can be made effective in positively influencing behaviors, and on the complementary roles of industry- and school-based training. Key informants of the situation in schools are the teachers themselves, the perspectives of whom have received little attention in the literature (Salminen and Palukka, 2007). In this combined qualitative and quantitative study of teachers in South Australia, we sought to systematically assess teachers' approaches and attitudes regarding school-based occupational safety education, and to identify teacher attributes, school characteristics and teaching methods most predictive of effective learning (according to teachers' perceptions). The main focus of this paper is on introductory occupational safety education provided prior to work experience programs usually offered in 10th grade, and corresponding approximately to the minimum working age of 15 years.

2. Materials and methods

2.1. Occupational safety education in South Australian high schools

The education system in Australia is broadly similar to that in other developed countries, comprising compulsory primary and secondary education and non-compulsory tertiary education. Secondary education (or high school) comprises year levels 8–12, and is compulsory to year 10. Schools in South Australia (a State of 1.6 million persons), both Government and non-Government, are required to follow the same curriculum framework, which allows for some flexibility. At senior secondary level (years 10–12), students study a combination of compulsory and elective subjects. All schools offer pathways to both vocational education and university. Occupational safety education may be delivered to high school students in one of two ways: (1) within a subject (as a topic or to prepare students for subject-related work placements) or (2) to prepare students for work experience programs, usually conducted in year 10, in which the almost all students participate, regardless of subject choice. In South Australia, various teaching resources are made available to the state's 211 high schools, including *Passport to Safety*, a Canadian-developed resource, and *Workplace Learning Guidelines* published by the educational authority, the Department of Education and Children's Services [DECS] (2008). Although the *latter* are provided to assist schools' compliance with the duty of care requirements, the extent to which they are applied is uncertain.

2.2. Methods

2.2.1. Qualitative methods

Perspectives on occupational safety education were gathered via two focus group discussions and five interviews with relevant educators. Four *School-to-Work* Advisors (erstwhile teachers) participated in the first focus group and five high school teachers participated in the second focus group. The teachers represented both public (government) and private (non-government) metropolitan schools in the capital city of Adelaide and each held the role of *VET Coordinator,* with responsibility for coordinating vocational education programs including work placements. Participants were engaged with structured questions aiming to identify and explore current practice, barriers and facilitators relating to occupational safety education. The duration spent on each of the structured questions was untimed and the participants were allowed to elaborate on any of the topics that were covered, as well as to comment on or introduce topics that were not covered at the conclusion of the session. Occasionally the facilitator would seek to clarify the responses to a topic by asking additional questions.

In addition, telephone interviews were conducted with five teachers in rural locations. It was decided that a standardized, structured interview would fare better than a semi-structured format (Patton, 2002). The participants were invited to respond to a series of broad questions relating to attitudes, current practice, barriers and incentives. To ensure that consistency could be maintained across interviews and a comparison could be made between interviewees, the same pre-determined questions were asked of each interviewee in the same way and order (Patton, 2002).

The sessions were recorded and transcribed. The data were analyzed using thematic analysis with a data-driven approach (Boyatzis, 1998). Themes and codes were developed according to descriptions and examples presented by Braun and Clarke (2006).

Although the methodology was based on a data-driven approach, the authors had acquired pre-conceived ideas from the research literature that may have influenced development of the themes (Boyatzis, 1998). In order to eliminate possible biases introduced by the researcher, the researcher repeated the thematic analysis a fortnight later to ensure that results were valid at a different point in time. The same phenomena that initially emerged were replicated.

2.2.2. Quantitative methods – questionnaire survey of teachers

A draft questionnaire was initially developed utilizing the findings of the abovementioned discussions and interviews, and then refined with the input of Advisory Committee that included key stakeholder representatives. To assess comprehensibility and logical flow of the self-administered questionnaire, six teachers participated in a pilot survey. The questionnaire included questions within the categories of teacher role and background, teacher training, resources, current practice, perspectives on student learning and participation, school support and barriers and incentives. [The questionnaire is available as Supplementary data item 1]

A questionnaire survey package was posted to each high school. It contained a cover letter for the school Principal, instructions and several questionnaires (with individual reply paid-envelopes) for teachers with safety teaching responsibility. Participants were asked to return the questionnaire within two weeks of receipt. Three weeks after the packages were sent, a reminder was sent by email to the Principal of each school.

2.2.3. Quantitative methods – statistical analysis

The questionnaire contained both closed questions and open questions, the responses to which were categorized. For descriptive analysis, Microsoft Excel® was used. To quantify associations between variables, the Statistical Package for the Social Sciences (SPSS) Version 18® was used. Firstly, bivariate logistic regression analyses were conducted to investigate correlates of teacher perspectives on student learning and engagement (three variables, namely *positive student response*; *gain of knowledge by students*; and *student engagement and participation*) and whether teachers felt that the topic was easy to teach. The analysis included independent variables relating to three broad categories, i.e. teacher demographics and background, school environment and teaching methods. Statistical significance was defined as a two-tailed p-value of 0.05 or less. For each outcome variable, the statistically significant independent variables were included in a multivariate logistic regression model to identify possible predictors of positive educational outcomes.

2.3. Ethics

Ethical approval for the research was granted by the University of Adelaide Human Research Ethics Committee, and the research