

## Corrigendum

# Corrigendum to: Outcomes of a Safety and Health Educational Intervention in Auto Body and Machine Tool Technologies Vocational College Programs: The Technical Education Curricula for Health and Safety (TECHS) Study

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The Introduction of the original article contained a number of errors as an incorrect version was accidentally supplied. These have now been corrected.

### Introduction

Career technical education (CTE) programs prepare students to succeed in building rewarding careers in various trades. The number of sub-baccalaureate occupational credentials awarded in the United States increased by 44% between 2003 and 2015, from 1.01 to 1.46 million. Credentials in manufacturing, construction, repair, and transportation accounted for just over 20% (80,400 credentials) of this increase. As of 2015, 64% of credentials were awarded by 2-year public institutions such as technical and vocational colleges (Zhang and Oymak, 2018). By 2020, some forecast 45% of the manufacturing jobs will require at least a 2-year degree (Georgetown University, 2011).

In vocational colleges, students acquire trade-specific knowledge, skills, and other competencies through classroom instruction and hands-on practice in workshops and laboratories. Students are introduced in a step-wise fashion to the tools, concepts and principles of their trade, and develop their skills by performing tasks under their instructors' supervision. The national skills standards define industry-validated expectations about what vocational students should know and be able to do after completing a career program (Advance CTE, 2008).

These standards serve as a guide for curriculum development, assessment, and program planning (Ruffing, n.d).

Safety and health knowledge and skills are foundational for all career fields (MN Department of Education, 2016). The inclusion of safety and health as a separate subject in the national skills standards presents a unique opportunity to stimulate safety and health education in vocational programs (Palassis *et al.*, 2004), as well as to research and to evaluate safety and health educational interventions (Schulte *et al.*, 2005; Runyan *et al.*, 2012).

Studies conducted in vocational programs in Germany (Löffler *et al.*, 2006) and Taiwan (Wong *et al.*, 2005) show that college-based safety and health education improves new workers' knowledge of hazards, behaviors, and rates of work-related injuries and illnesses. A 2-year prospective study conducted in France found that vocational college graduates (n=744 from 204 institutions) who reported receiving safety and health training in school experienced half as many injuries as their peers who did not receive this training (Boini *et al.*, 2017). A U.S. study of a union-based apprentice carpenter education program identified gaps in safety and health knowledge and work practices among apprentices. Recommendations were made to modify the materials and instruction methods to

match the diversity of job-related situations encountered (Kaskutas *et al.*, 2010). The number of job-related falls decreased post-intervention, but the safety climate in the workplace influenced the magnitude of improvements (Evanoff *et al.*, 2012).

Auto body collision technology (ABCT) and machine tool technology (MTT) are vocational programs that prepare technicians for careers in collision repair and machine manufacturing. Technicians in these trades are exposed to known chemical (isocyanates, metal working fluid), physical (noise, machine hazards), ergonomic (lifting heavy objects, slips and trips) and electrical and fire hazards (Bejan *et al.*, 2011; Ceballos *et al.*, 2014; Reeb-Whitaker *et al.*, 2012; Samant *et al.*, 2006; Whittaker and Reeb-Whitaker, 2009; Yamin *et al.*, 2016). Technicians frequently work in small businesses that rarely provide Occupational Safety and Health Administration - mandated safety and health training, work with little supervision, and are expected to know how to work safely (Brosseau *et al.*, 2014; Burt *et al.*, 2012; Eakin, 1992; Hasle *et al.*, 2009; Parker *et al.*, 2012). Technicians who attend vocational college have

the opportunity to learn about safety and health in their trade, as well as learn and practice safe behaviors. As such, the quality and effectiveness of this education are critical.

Previous work highlights the lack of information on safety and health training in CTE, calling for quality research in this area (Bush and Andrews, 2013). Whereas recent reports fill in the gap regarding safety and health in construction programs (UCB-LOHP, 2017; Bush *et al.*, 2019), little is known about other vocational programs.

Technical Education for Health and Safety (TECHS), a multi-phase research study aims to: (1) document the teaching and evaluation of workplace safety and health in two-year ABCT and MTT vocational college programs; (2) identify training gaps and improvement needs; (3) develop, implement and evaluate new safety and health curricula; and, (4) determine the impact of the new curricula on graduates' safety and health knowledge, skills, and work practices at one year after graduation. This paper describes the new curricula and discusses the graduate survey results.