**Background**

Technical Education Curricula for Health and Safety (TECHS) study is an educational intervention conducted in partnership with two vocational colleges in Minnesota. After an extensive baseline evaluation of the materials and methods used prior to enrolling in the TECHS study, new curricula were designed and developed with input from all instructors in the auto body collision technology (ABCT) and machine tool technology (MTT) programs in both colleges, and was implemented beginning with the 2015-2016 academic year. Goal: evaluate the impact of a newly designed, trade-specific comprehensive safety and health curricula, delivered systematically throughout a 2-year program.

Hypothesis: Vocational students that receive comprehensive safety and health information about the hazards in their trade and learn skills and work practices while in college, will have significantly better knowledge, skills, and work practices at 1 year after graduation.

**Methods and Materials**

The TECHS curriculum for each trade included the following modules:

- **ABCT**
  - FULL MODULES
    - Full-Body Motion
    - Materials Handling
    - Electrical Safety
    - Fire Safety
    - Respirators
  - REFRESHER MODULES
    - Personal Protective Equipment

- **MTT**
  - FULL MODULES
    - Machine Guarding
    - LOTO Awareness
    - Material Handling
    - Respirators
  - REFRESHER MODULES
    - Personal Protection
    - LOTO Awareness
    - Material Handling
    - Respirators

Each module includes: Instructors’ Guide, Student’s Guide, classroom presentation (PowerPoint presentation with narrative and notes for each slide), lab activities, homework, quiz, and supplemental materials on the topic of the module. At the end of the year, students took an anonymous test. All materials were uploaded within each college’s online learning environment: Desire to Learn (D2L).

**Instructor Activities**

Prior to the start of the 2015-2016 academic year, all instructors teaching in the ABCT and MTT programs attended a 4-hour training session on: (1) how to manage course content in D2L, (2) practice teaching a classroom presentation; (3) review the lab activities, homework, and quizzes; (4) plan each module delivery to optimize students’ ability to use the information in an immediately relevant context; (5) learn to use curriculum delivery training tools.

**Graduates Follow-up**

ABCT and MTT graduates class of 2015 and class of 2016 were received an electronic survey distributed 1 year after graduation. Respondents were compensated $20 for participation. ABCT graduates answered 16 questions on isolataniates, respirators, solvents and acids, fire and electrical safety, and, eye and hearing protection. MTT graduates answered 9 questions on machine guarding, lockout/tagout, materials handling, and, eye and hearing protection. All graduates rated their safety-related skills and work practices, and completed a 13-question safety climate survey.

**Results**

**ABCT**

Class of 2015: 40 graduates → 18 surveys returned → 11 working in the trade (81%)

Class of 2016: 71 graduates → 52 surveys returned → 39 working in the trade (68%)

**MTT**

Class of 2015: 29 graduates → 30 surveys returned → 19 working in the trade (65%)

Class of 2016: 57 graduates → 33 surveys returned → 21 working in the trade (65%)

**Results - ABCT**

**ABCT**

Knowledge - Mean Scores

Skills - Mean Scores

**Results - MTT**

**MTT**

Knowledge - Mean Scores

Skills - Mean Scores

**Conclusions**

When classroom presentations are delivered during the 2nd year of a 2-year program, graduates’ knowledge about safety and health increases, sometimes significantly. However, without conducting the lab activities, and assigning and discussing homework tasks, no significant impact on skills and work practices is observed at 1 year after graduation. Since nearly 72% of collision repair shops technicians and 47% of the machinists working in manufacturing companies attended some classes or graduated from vocational college programs in their trade, these institutions play an exceptionally prominent role in graduates’ safety and health education.

Several barriers to implementing a comprehensive safety and health curricula in vocational college exist, even when materials are created with direct input from instructors. Primarily, barriers are administrative, but also due to instructors’ gaps in safety knowledge and lack of pedagogic skills. After 1 year of using the TECHS curricula, instructors had positive feedback as well as several suggestions and recommendations. These were used to update the TECHS materials used beginning 2016-2017 academic year. Challenges are addressed through continuous instructor coaching and by creating and delivering additional instructor training on specific safety and health topics. The TECHS curricula implementation continues and results will be reported in future publications.