



Are vocational college instructors effective at teaching health and safety? Results from the TECHS study 2015-2016.

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Objective: Evaluate knowledge of key health and safety issues at the end of each academic year, and at one year after graduation from a 2-year program in auto body collision technology (ABCT) or machine tool technology (MTT) at two vocational colleges in Minnesota. Collect information on work practices, safety-related skills and perception of the work environment after one year of employment, and identify factors that influence work practices.

Methods: At the end of the school year, all students were asked to complete a survey. ABCT students answered 21 questions on isocyanates, respirators, solvents and acids, fire and electrical safety, and, eyes and hearing protection. MTT students answered 20 questions on machine guarding, lockout/tagout, materials handling, and, eyes and hearing protection. One year after graduation, graduates were sent an electronic survey with four sections: Knowledge, Work Practices, Skills, and Work Environment.

Results: Fifty-one ABCT students from College A and 25 from College B filled in surveys. Students completing 2 years of instruction in College A had survey scores that ranged from 57% to 91% (mean=76%, SD=10%). Students in College B had scores ranging from 57 to 91% (mean=72%, SD=10%). Survey scores of students that completed 1 year of instruction were 29-90% (mean=66%, SD=13%) in College A, and 67-91% (mean=81%, SD=7%) in college B. The number of years of instruction made a significant difference in the survey scores within each college ($p=0.02$), however the difference was not always in the expected direction. At the end of the first year of instruction, students attending College B answered correctly significantly more questions than students attending College A ($p<0.0001$). Seventy-eight MTT students from College A and 51 from College B completed surveys. There were no significant differences between the scores of students attending college for 1 year vs. 2 years. The graduating class of College B had significantly higher survey scores (mean=81%, SD=10%) than graduating class of College A (mean=67%, SD=14%, $p=0.0001$).

Eighteen ABCT graduates and 52 MTT graduates completed the electronic survey sent 1 year after graduation. Even though the average survey scores in the Knowledge section increased slightly, there continued to be a significant difference in the scores of MTT graduates from the two colleges. This suggests that knowledge differences persist throughout the first year of employment. There were no significant differences in the work practices reported by the MTT graduates ($p=0.63$). However, ABCT graduates from College B had significantly lower scores than graduates from College A ($p=0.01$), despite scoring higher in the Knowledge section of the survey. Regression analysis indicates that an increase in Knowledge scores does not have a significant effect on improving work practices scores ($p=0.1$). However, a 1% increase of the scores in the Skills or Work Environment sections would lead to a 0.28% ($p=0.02$) and 0.52% ($p<0.0001$) improvement in work practices scores.

Conclusions:

Students are graduating with incomplete knowledge of important safety and health issues. Gains in health and safety knowledge during the first year of employment do occur. However, when students enter the workforce with significant differences in knowledge of health and safety, these difference remain significant at 1 year after graduation. Improving the health and safety skills with which graduates enter employment may provide the best means to improving their work practices. Since most of the ABCT graduates will be working in small or very small businesses with few resources and incentives to train their employees on safety issues, a successful intervention at the vocational college level is critical.

