

EXECUTIVE SUMMARY

Technology education in BC schools has changed in recent years as a result of funding cuts and class size numbers. There are fewer technology education teachers teaching larger classes with fewer supplies, small budgets, inadequate equipment, and irregular maintenance on equipment. In an attempt to address the resultant problems in program quality and teaching and learning conditions, the BC Technology Education Association (BCTEA), a provincial specialist association of the BC Teachers' Federation (BCTF), has compiled a comprehensive document outlining recognized best practices. Health and safety is an underlying theme in all sections.

The technology education environment

Teaching and learning in technology education take place in school facilities that are similar to industrial workplaces. WorkSafeBC health and safety policies cover the teachers and other school district employees, who work in these settings, but do not generally apply to students.¹ The BCTEA believes that WorkSafeBC should cover students, and that a separate set of WorkSafeBC policies should be developed to address the unique safety issues pertaining to students working and learning in an industrial environment. The most significant factors which influence safe learning environments for technology education students are class size and composition, teacher qualifications, education assistant (EA) training, facilities, maintenance and budgets.

Class size and composition

Current class size legislation of the School Act allows technology education classes of 30 students, the same limit as any other subject area, unless the local teachers' union previously successfully bargained a lower class size number. Many locals have negotiated lower class sizes such as 24 or lower, for Technology classes. This would need to be confirmed at the local level. For those who do not have local language, the School Act provisions may even be exceeded under certain circumstances. Provincially, there is no acknowledgement in class size legislation of the unique safety issues in the industrial settings typical of shops in secondary schools. Complicating the issue is the growing trend of multi-grade, multicourse classes where a teacher is instructing two to four grade levels of students in different curricula during the same class. Furthermore, Technology Classrooms do not have standardized physical space or layout plans. Additional considerations should be made in regard to safe occupancy of the teaching space based on grade level, equipment, and subject matter.

The BCTEA takes the position that class size in technology education classes should be based on:

- *the inclusion of EAs in any class count.*
- *an absolute limit of 20 students and EAs per teacher (with the exception of drafting classes) or the number that can be safely accommodated in the facilities as designed and equipped, whichever is lower.*
- *possible further reductions if the class includes beginning ESL students or students with special needs who require additional or unique safety supervision.*
- *a teacher-student ratio that allows for adequate supervision considering the number of courses running concurrently, and the equipment required for the course (e.g., a senior wood shop presents different supervision challenges than a senior electronics shop).*

¹ The *Workers Compensation Act* applies in some cases to students who are engaged in vocational training or apprenticeships. See *Workers Compensation Act*, [RSBC 2019] c. 1, s. 1 definition of "worker".

- *a minimum floor area, defined in terms of useable floor area; i.e., not covered by machinery, furnishings, etc., that is adequate for the specific program and its associated equipment, storage, and workspace needs, and*
- *a minimum area per student to allow for safe working space in the context of the specific program and its associated equipment and activities.*

The BCTEA supports the inclusion of students with special needs in technology education classrooms that many students with or without any identified special needs may require an individual education plan if they are to function safely in a shop environment and achieve the goals of the curriculum. Aspects particular to technology education should be clearly defined in the IEP.

Teacher qualifications

For a variety of economic, social, and educational reasons it has become increasingly difficult to employ and retain well-trained technology education specialists in the province's public schools. This has resulted in many teachers without specific training in technology education, teaching technology education courses. Some have industry experience and/or qualifications while others are self-taught or hobbyists. In these situations, the employer as well as the Ministry of Education are encouraged to assist teachers with the appropriate qualification process, including TRB certification, as well as a practicum in a Tech Ed shop. This will not only help the teacher with classroom management in the shop environment, but also help to ensure that both students and teacher have a positive experience. The nature of teacher qualifications is a factor in program quality and in the safety of the teaching and learning environment.

Training for Education Assistants (EAs)

Increasingly, technology education classes have EAs working with special needs students. Educational assistants, like all other employees, are subject to rights and responsibilities under WorkSafe BC legislation, including the right to training and the right to refuse unsafe work. For an educational assistant to effectively supervise and assist the assigned student(s), they must have a reasonable and verifiable understanding of the procedures, practices, machinery, and tools being used in a particular course and setting. Employers are obligated under WorkSafe legislation to provide training in safe work protocols and to ensure that these protocols are being followed.

Facilities

The BCTEA recommends the establishment of a provincial program advisory committee, comprised of technology education teachers appointed by the BCTF and representatives from industry and post-secondary institutions, to establish provincial standards regarding facility design and a minimum equipment inventory.

Two areas critical to facility design are:

1. A minimum floor area, defined in terms of useable floor area; i.e., not covered by machinery, furnishings, etc., that is adequate for the specific program and its associated equipment, storage, and workspace needs, and

2. A minimum area per student to allow for safe working space in the context of the specific program and its associated equipment and activities.

The advisory committee's recommendations would be used to plan and maintain shop facilities throughout the province. In the meantime, the BCTEA offers standards for both facilities and equipment needed to effectively run technology education programs in our schools. The standards are intended to apply to new construction or renovations to existing facilities.

Budgets

The BCTEA recommends the formation of a provincial program advisory committee to assist in the establishment of a basic equipment inventory that school districts could use to develop realistic budgets. This group would be comprised of representatives from industry, post-secondary training and teachers of technology education and would have a good understanding of costs relating to tools and equipment necessary to carry out technology education programs.