Training Gaps Analysis

Automation Technicians

Cultural Human Resources Council (CHRC)
Automation Technicians
Training Gaps Analysis
Final Report
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Introduction

In September 2005, the Cultural Human Resource Council (CHRC) issued a Request for Proposal to conduct a Training Gaps Analysis with automation technicians in the cultural sector across Canada ("the RFP"). Having responded to the RFP, kisquared was selected by the CHRC Theatre Technicians Steering Committee to conduct the 2005 analysis.

The 2005 Training Gaps Analysis builds upon earlier work conducted by the Automation Technicians Expert Working Group (EWG), which compiled a matrix of core competencies that define the skill sets of automation technicians.

The primary data-gathering instrument used was the Employer and Employee survey, based closely on the automation technician core competencies matrix. Interviewing was conducted in French and English from kisquared's offices in Winnipeg, Manitoba.

Throughout the research process, kisquared worked with the Steering Committee and the Automation Technician EWG, receiving invaluable assistance from members of both groups.

Objectives

The objectives of this training gaps analysis are to:

- Measure the training needs of automation technicians;

- Explore training offerings; and

- Determine the training gaps and offer recommendations.

Methodology

The research methods used in this project are discussed in more detail below. They included:

- Secondary research

- Stakeholder consultations

- Employer and employee survey

- Interviews with colleges and training institutions

Secondary research

The training gaps analysis began with secondary research to review the available offerings of formal training available for automation technicians (ATs).

This phase included a comprehensive review of program and curriculum content of technically-oriented programs taught in colleges and Cégeps, as well as technically-oriented university programs in Canada.

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University theatre major programs are not reviewed generally in this report, because the study's primary focus is training *vis-à-vis* a technically-oriented skill set, whereas the emphasis of most university theatre programs is primarily on the art and performance of theatre.

Stakeholder consultations

kisquared project managers consulted with members of the Steering Committee and the EWG from the outset of the project, gaining valuable insight into the world of the automation technician. **kisquared** worked with members of the Steering Committee to identify a sample base of potential respondents, and to raise potential respondents' awareness of this study along with the benefits of their participation in it.

Employer and employee survey

The employer and employee survey gathered information pertaining to both training needs and offerings. The questionnaire was submitted to the CHRC for distribution to the Steering Committee, and approved before fielding commenced.

In total, **kisquared** conducted **191 interviews**:

- 67 interviews with **employers**

- 124 interviews with **employees**

Efforts were made to contact automation technicians from across the country and ensure a representative sample of the AT sector in Canada. **kisquared** conducted interviews with major employers including production companies, manufacturers, and theatre companies.

The margin of error for the survey (at the 95% confidence level) is ±5.65%.

Interviews with colleges and training institutions

After the employee and employer surveys were completed, a series of 18 interviews were conducted with program directors of college programs offering technical training specific to ATs, to validate findings about training offerings identified through secondary research, and identify any training gaps.

Questionnaire design

Automation technician definition

The term "automation technician" (AT) is not used by most employers or employees. In the theatre world, the term generally is used to refer to individuals working on large-scale and high-tech productions. This training gaps analysis uses a broader definition of AT that is able to include all those working with the moving scenic elements of a live performance, both high and low-tech.

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Employers interviewed tended to be production managers, technical directors of theatres, or department heads. Employees interviewed sometimes described themselves as automation technicians, but more often as stage carpenters, stage electricians or stagehands. Because of the wide range of occupational titles for those potentially performing the tasks of an AT, the questionnaire did not rely upon job titles alone to identify the target respondent, but relied instead upon the AT definition below:

Employee

- Are you someone who is involved as an installer, operator, troubleshooter or maintenance person with the automation technology on a live music, theatrical, dance, or film production?

- Êtes-vous un installateur, un opérateur, un dépanneur ou une personne d'entretien en technologie d'automatisation dans la production de concert musical en direct, de pièce de théâtre, de danse ou de film?

Employer

- Do you employ people who are involved as installers, operators, troubleshooters or maintenance persons with the automation technology on a live music, theatrical or dance production?

- Employez-vous des opérateurs, dépanneurs ou du personnel d'entretien en technologie d'automatisation dans la production de concert musical en direct, de pièce de théâtre, de danse ou de film?

Chart of competencies converted to measurable skills

For the purposes of questionnaire design, the skill sets contained in the chart of competencies were converted to the language of skills.

The survey measures the following *AT-specific* skills:

- Install, assemble, test, dismantle and pack an automation system

- Program advanced cueing on an automation system

- Operate an automation system or console for a live show

- Determine maintenance needs of automation systems (for example, hydraulic, pneumatic, electronic, electrical, mechanical, or computer systems)

- Maintain and repair an automation system (for example, hydraulic, pneumatic, electronic, electrical, mechanical, or computer systems)

- Provide technical expertise and advise during rehearsals and shows

- Create show cue sheets and record back-up of show cues

- Write technical documents

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- Ensure a safe workplace and compliance with regulations and codes (for example, fire, building, electrical, mechanical, environmental codes and regulations).

- Operate rigging equipment

- Operate man lifts and fork lifts

- Use and interpret non-verbal signals

- Practice theatre etiquette in a teamwork atmosphere

- Work at heights

The survey also measures the following *general skills* relevant to an AT:

- Ability to prioritize, make decisions, and problem solve

- Communicate ideas effectively in oral or written form

- Handle general administrative duties like maintenance incident logs, reports, spare parts lists, and shipping / receiving documents

- Train substitutes or replacements

- Operate a computer (includes installing software and firmware upgrades)

- Operate conventional hand and/or power tools

Reporting

This report is organized under the following headings: *Introduction*, *Executive summary*, *Training needs*, *Training offerings*, *Chart of competencies – validation*, *Skills acquisition through formal training*, *Training gaps*, and *Respondent profile*. *Appendix A* contains survey "marginals" (response percentages for each question asked in the survey). *Appendix B* contains summary descriptions of AT-specific training programs available across Canada. *Appendix C* lists responses concerning any skills acquired or expected to be acquired through formal training.

Appendix D contains verbatim responses to the following questions from the employer and employee survey:

- Are there any skills or skills training we have missed speaking to you about, or that you think may be required in future?

- Are there any other ways that automation technicians can learn the skills they need to do their jobs?

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Executive summary

The objectives of the 2005 Training Gaps Analysis for automation technicians were to measure training needs, explore training offerings, and determine the training gaps while offering recommendations.

Respondent profile

- Automation technicians from all ten provinces and two of three Territories were interviewed. Almost half (45%) are in Ontario, while 19% are in B.C. and 18% in Alberta.

- About two-thirds of respondents (65%) are automation technician employees, and slightly more than one-third (35%) are employers of automation technicians.

- Most respondents (87%) are involved in live theatre or musicals. One-third (34%) are involved in rock/pop or other music concerts, and 25% in dance.

- One-third of employers interviewed employ an average of 26 to 50 workers in their company, and one-quarter employ an average 11 to 25 employees. Nearly two-thirds of all employers surveyed employ five or fewer automation technicians in their company.

- Among employees, 68% are IATSE members. Among employers, 54% employ workers who belong to IATSE.

- More than two-thirds of all respondents (68%) have been actively involved in the industry for more than ten years, whereas only one-third (33%) have been in the industry for less than ten years.

Training needs

- Most automation technicians already possess most of the AT-specific and general skills tested. For instance:

    - A full 96% are able to use theatre etiquette in a teamwork environment.

    - Ensuring a safe workplace and compliance with regulations and codes is a skill held by 92%.

    - Ninety-two percent are able to work at heights.

    - Almost as many (91%) can provide technical expertise and advice during rehearsals and shows.

- Not surprisingly, the skills tagged as not needed for automation technicians are the same skills they are least likely to have. This is particularly evident with:

    - Writing technical documents (unnecessary, 46%; have, 50%)

    - Maintaining and repairing automation systems (unnecessary, 34%; have, 54%)

    - Operating man lifts and fork lifts (unnecessary 27%; have 72%)

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- Determining maintenance needs of automation systems (unnecessary 23%; have 66%)

- Operating rigging equipment (unnecessary 23%; have 75%).

- When skills identified as "needed" by automation technicians are compared with those that they already have, skill gaps can be calculated. The biggest gaps are those associated with the following skills:

  - Program advanced cueing on automation systems (20%);

  - Determining maintenance needs of automation systems (13%); and

  - Installing, assembling, testing, dismantling and packing automation systems (13%).

Training offerings

- An important finding that holds true across all 20 skills measured is that the skills required by automation technicians are most often learned *on the job.* Almost all employees and employers overwhelmingly indicate on the job training as the primary method of skills acquisition.

- Self-teaching of skills is infrequently used. The skills most often cited by respondents as gained through self-teaching (installation, assembly, testing, dismantling and packing of an automation system, and programming advanced cueing on an automation system) were chosen by only 24%.

- Formal training plays an important role in educating automation technicians. However, it is not in demand equally across the board, but concentrated in a few skill areas, such as:

  - operating rigging equipment, operating man lifts and fork lifts;

  - installing, assembly, testing, dismantling and packing of an automation system;

  - programming advanced cueing on an automation system; and

  - operation of an automation system or console for a live show.

- The length of programs in those institutions that offer training specific to automation technicians ranges from two days to three years, whereas the program length at colleges and universities is three to four years, with colleges having shorter programs (closer to two years) and universities longer ones (usually closer to three or four years).

- Less formal training, such as attending a conference or workshop, is another popular method of skills acquisition for many. Thirty per cent of respondents say they have attended conferences or workshops related to professional development within the past year.

- Institutions offering AT-specific training include:

  - Douglas College (British Columbia)

  - Langara College (British Columbia)

  - Malaspina University-College (British Columbia)

  - University College of the Fraser Valley (British Columbia)

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- The Banff Centre (Alberta)

- Grant MacEwan College (Alberta)

- Keyano College (Alberta)

- Mount Royal College (Alberta)

- Red Deer College (Alberta)

- Cambrian College of Applied Arts and Technology (Ontario)

- Humber College Institute of Technology & Advanced Learning (Ontario)

- Redeemer University College (Ontario)

- Ryerson Theatre School (Ontario)

- Sheridan College (Ontario)

- Cégep de Saint Hyacinthe (Québec)

- Collège Lionel-Groulx (Québec)

- National Theatre School of Canada (Québec)

- John Abbott College (Québec)

- Regional differences occur regarding formal training for AT-specific skills. No formal training specific to AT skills is offered in the Prairies, the Maritimes and the North. There are, however, formal training opportunities for AT-specific skills in the West (including B.C. and Alberta) and Central Canada (including Ontario and Québec).

- Although not formally measured, corporate training (that is, training provided by suppliers and manufacturers), plays an important role in skills acquisition. This training, however, is usually specific to the set-up of the show itself rather than encompassing broader skills acquisition *per se*.

Training gaps analysis

- Findings indicate that on the job training is important in the development of all AT-specific skills. For every skill assessed, at least 50% identified on the job training as a means by which skills will be acquired.

- The role of self-teaching is less consistent. Of those facing a skills gap, self-teaching was cited by at least 20% for the following skills:

  - using and interpreting non-verbal signals;

  - ensuring a safe workplace and compliance to regulations and codes; and

  - operating rigging equipment.

For other skills, self-teaching is less commonly expected.

- Formal training is only important for some skills, in particular those potentially affecting personal safety:

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- operating man lifts and fork lifts (67%);

- working at heights (50%);

- operating rigging equipment (40%).

- In AT-specific technical and diagnostic skills, formal training is expected by approximately one-third of those who need each skill. Formal training is expected to play a much smaller role for most skills other than these:

  - determining maintenance needs of automation systems;

  - installing, assembling, testing, dismantling, and packing an automation system;

  - maintaining and repairing an automation system; and

  - providing technical expertise and advice during rehearsals and shows.

- Most AT-specific skills are taught by a majority of the 18 institutions interviewed. Three skills that are *not* generally taught pertain to AT-specific problem-solving and technical expertise: determining maintenance needs of automation systems (offered by only five out of 18 institutions); installing, assembling, testing, dismantling, and packing an automation system (five out of 18 institutions); and maintaining and repairing an automation system (three out of 18 institutions). These represent the second, third and fourth largest skills gap – and about one-third of those needing each skill expect it to be addressed through formal training. These findings suggest that institutions are not offering the formal AT-specific technical and diagnostic training required to close these gaps.

- Several program directors of AT-specific institutions made a point of noting in their interviews that their program budgets did not allow them to purchase the automation systems (i.e., the actual equipment) that would be necessary to add training related to the installation, assembly, testing, dismantling, maintenance and repair of automation systems into the curriculum. This represents a challenge that will have to be addressed if skill gaps in this area are to be closed through formal training.

Chart of competencies – validation

- The CHRC chart of competencies effectively captures the range of skills required by automation technicians. After reviewing the skills list, respondents were asked if there were any additional skills used in their jobs not yet mentioned. Eighty-two percent of respondents found the list to be comprehensive. However, the following additional skills were mentioned by some as missing from the list:

  - Math / computer skills (7%)

  - Safety / First Aid (6%)

  - Creativity and design (5%)

  - Welding / electrical skills (3%)

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Recommendations

- Given that automation technicians primarily learn skills on the job, the implication for training focuses upon the need for apprenticeship programs and / or co-op programs to assist new learners in acquiring the skills in a more formalized fashion.

- The nature of automation technology is such that it is often show-specific, not generic. Therefore, even where a gap exists in terms of formal training offerings for these skills, suppliers and manufacturer should continue to give ongoing support in-house to meet these training needs. The manufacturers and the suppliers are best placed to offer training on specific proprietary technology.

- Due to the highly specific nature of proprietary automation technology and the prohibitive costs associated with its purchase, formal training programs should consider exploring possibilities for partnership with suppliers and manufacturers as a way to address these gaps through formal training. This may be more cost-effective for training institutions and would allow the programs to continually remain up-to-date with training on the latest technologies.

- Consult with institutions offering AT-specific technical and diagnostic skills.

- Further explore with colleges offering AT-specific training what the barriers are to offering training. Our research revealed funding as a barrier to offering certain training specific to automation technicians but there may be other barriers to offering training that need to be explored.

- Consult with formal training institutions in the Prairies, the Maritimes and the North about offering training in these regions.

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Training needs

All respondents were read the skill series. Employers were asked to indicate whether their automation technicians already have a skill, need that skill, or do not need the skill; employees were similarly asked to rate themselves in relation to each skill. Results are displayed in Figure 1. Please note that all skills measured have been grouped into two categories: those specific to automation technicians, and those skills not exclusive to automation technicians, but more general in nature.

Current skills

Figure 1, below, represents the range of skills already present within the industry.

- Almost all automation technicians have AT-specific skills of practising theatre etiquette in a teamwork environment (96%), ensuring a safe workplace and complying with regulations and codes (92%), working at heights (also 92%), and providing technical expertise and advice during rehearsals and shows (91%).

- A smaller proportion of automation technicians tend to have the AT-specific skills of writing technical documents (50%), maintaining and repairing automation systems (54%), programming advanced cueing on automation systems (64%) and determining the maintenance needs of automation systems (66%).

- Turning to general work skills, almost all automation technicians claim skills in prioritizing, making decisions and problem solving (97%), operating conventional hand and power tools (96%), communicating ideas effectively in oral and written form (95%) and operating computers (85%).

- The majority of automation technicians report having all the general skills tested; however, skills less widely claimed include the ability to perform general administrative duties (73%), and to train substitutes or replacements (76%).

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Figure 1   CURRENT SKILLS

Skill (AT-specific)	% of respondents overall	
Practice theatre etiquette in a teamwork atmosphere	96%	
Ensure safe workplace and compliance with regulations, codes	92%	
Work at heights	92%	
Provide technical expertise and advice during rehearsals and shows	91%	
Use and interpret non-verbal signals	84%	
Operate automation system or console for live show	82%	
Create show cue sheets and record back-up of show cues	82%	
Operate rigging equipment	75%	
Install, assemble, test, dismantle, pack automation system	74%	
Operate man lifts and fork lifts	72%	
Determine maintenance needs of automation systems	66%	
Program advanced cueing on automation system	64%	
Maintain and repair automation system	54%	
Write technical documents	50%	

Skill (general)		
Ability to prioritize, make decisions and problem solve	97%	
Operate conventional hand and/or power tools	96%	
Communicate ideas effectively in oral or written form	95%	
Operate computer including software installation, firmware upgrades	85%	
Train substitutes or replacements	76%	
General administrative duties	73%	

Note: Because multiple responses were accepted, figures exceed 100%.

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Unnecessary skills

Measuring current skills, as discussed above, involved asking employers and employees what skills they found to be not needed for automation technicians. Results are shown in Figure 2, below.

- One clear trend, not surprisingly, is that the skills identified as unnecessary are the same one automation technicians are unlikely to report having. This is particularly true with respect to writing technical documents, maintaining and repairing automation systems, operating man lifts and fork lifts, determining maintenance needs of automation systems, and operating rigging equipment.

- Most automation technicians already have the AT-specific skills identified as necessary, such as practising theatre etiquette in a teamwork atmosphere, ensuring a safe workplace and compliance with regulations and codes, working at heights, and providing technical expertise and advice during rehearsals and shows.

- The same trends occur when examining general work skills. Skills considered unnecessary, such as being able to perform general administrative duties or train substitutes or replacements, tend to be those that automation technicians say they do not have. Conversely, automation technicians tend to say they already possess the general skills that they consider necessary.

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Figure 2   UNNECESSARY SKILLS

■ Skill is unnecessary   ☐ Currently have skill

Skill (AT-specific)

Skill	Skill is unnecessary	Currently have skill
Write technical documents	46%	50%
Maintain and repair automation system	34%	54%
Operate man lifts and fork lifts	27%	72%
Determine maintenance needs of automation systems	23%	66%
Operate rigging equipment	23%	75%
Program advanced cueing on automation system	18%	64%
Create show cue sheets and record back-up of show cues	16%	82%
Install, assemble, test, dismantle, pack automation system	15%	74%
Use and interpret non-verbal signals	14%	84%
Operate automation system or console for live show	13%	82%
Provide technical expertise and advice during rehearsals and shows	8%	91%
Work at heights	8%	92%
Ensure safe workplace and compliance with regulations, codes	4%	92%
Practice theatre etiquette in a teamwork atmosphere	4%	96%

Skill (general)

Skill	Skill is unnecessary	Currently have skill
General administrative duties	24%	73%
Train substitutes or replacements	22%	76%
Operate computer including Software installation, firmware upgrades	12%	85%
Operate conventional hand and/or power tools	4%	96%
Communicate ideas effectively in oral or written form	3%	95%
Ability to prioritize, make decisions and problem solve	2%	97%

Note: Because multiple responses were accepted, figures exceed 100%.

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Skill gaps

For each skill tested, employers and employees were asked to specify the skills that automation technicians do not have, yet need.

- Although the percentage that already "has" a given skill always greatly outweighs those who still "need" that skill, there are a few noteworthy gaps between required and available skills. The largest calculated gaps exist in the areas of programming advanced cueing on automation systems (20%), determining maintenance needs of automation systems (13%), and installing, assembling, testing, dismantling and packing automation systems (13%). Smaller skill gaps are found in the maintenance and repair of automation systems (9%), and the operation of automation systems or consoles for live shows (7%).

- Figure 3 below illustrates all current skills gaps.

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Figure 3   SKILLS GAP

Skill (AT-specific)	% of respondents overall	
Program advanced cueing on automation system	20%	
Determine maintenance needs of automation systems	13%	
Install, assemble, test, dismantle, pack automation system	13%	
Maintain and repair automation system	9%	
Operate automation system or console for live show	7%	
Ensure safe workplace and compliance with regulations, codes	6%	
Write technical documents	5%	
Operate man lifts and fork lifts	4%	
Operate rigging equipment	3%	
Create show cue sheets and record back-up of show cues	3%	
Use and interpret non-verbal signals	3%	
Provide technical expertise and advice during rehearsals and shows	3%	
Work at heights	2%	
Practice theatre etiquette in a teamwork atmosphere	2%	

Skill (general)		
General administrative duties	5%	
Communicate ideas effectively in oral or written form	5%	
Operate computer including Software installation, firmware upgrades	4%	
Ability to prioritize, make decisions and problem solve	4%	
Train substitutes or replacements	3%	
Operate conventional hand and/or power tools	1%	

Note: Because multiple responses were accepted, figures exceed 100%.

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Training offerings

Respondents who identified themselves or their employees as having a given automation technician skill or needing to acquire it, were then asked where that skill was acquired or where they expect it to be acquired. Employees were asked: "Where did you learn this skill? / Where do you expect to learn this skill?" For employers, the question asked was: "Where did your employees learn this skill? / Where do you expect them to learn this skill?" Responses were grouped into the categories of "learn on the job" "self-taught" or "formal training".

Learning on the job

Overwhelmingly, respondents indicated the skills required for automation technicians are learned on the job, as indicated in Figure 4 below. Even the skills *least* likely to be learned on the job (installation, assembly, testing, dismantling and packing of an automation system, and programming advanced cueing on an automation system) were still expected by 86% to be imparted that way. Thus, much of what is required for automation technicians to do their jobs is acquired through on the job training.

Figure 4   SKILLS LEARNING ON THE JOB

AT-specific skills	Learn on the job
Create show cue sheets and record back-up of show cues	95%
Practice theatre etiquette in a teamwork atmosphere	95%
Work at heights	94%
Maintain and repair an automation system	92%
Use and interpret non-verbal signals	92%
Operate an automation system or console for a live show	91%
Provide technical expertise and advise during rehearsals and shows	91%
Write technical documents	90%
Determine maintenance needs of automation systems	90%
Operate rigging equipment	88%
Operate man lifts and fork lifts	88%
Ensure a safe workplace and compliance with regulations and codes (for example, fire, building, electrical, mechanical, environmental codes and regulations)	88%
The installation, assembly, testing, dismantling and packing of an automation system	86%
Program advanced cueing on an automation system	86%

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Figure 4 cont'd

General skills	
General administrative duties like maintenance incidents logs, reports, spare parts list, and shipping/receiving document	98%
Train substitutes or replacements	95%
Ability to prioritize, make decisions, and problem solve	94%
Communicate ideas effectively in oral or written form	90%
Operate conventional hand and/or power tools	87%
Operate a computer (includes installing software and firmware upgrades)	87%

Self-teaching

Self-teaching, through reading magazines or on-line tutorials, for example, does not appear to be a popular method for learning the skills required by automation technicians, when compared to other skill acquisition paths.

Figure 5   *LEARNING SKILLS THROUGH SELF-TEACHING*

AT-specific skills	Self-taught
The installation, assembly, testing, dismantling and packing of an automation system	24%
Maintain and repair an automation system	18%
Program advanced cueing on an automation system	17%
Operate an automation system or console for a live show	16%
Determine maintenance needs of automation systems	13%
Use and interpret non-verbal signals	12%
Provide technical expertise and advise during rehearsals and shows	11%
Write technical documents	9%
Create show cue sheets and record back-up of show cues	8%
Operate rigging equipment	7%
Operate man lifts and fork lifts	7%
Ensure a safe workplace and compliance with regulations and codes (for example, fire, building, electrical, mechanical, environmental codes and regulations)	7%
Work at heights	5%
Practice theatre etiquette in a teamwork atmosphere	5%

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Figure 5 cont'd

General skills	Self-taught
Operate a computer (includes installing software and firmware upgrades)	21%
Operate conventional hand and/or power tools	20%
Communicate ideas effectively in oral or written form	13%
Ability to prioritize, make decisions, and problem solve	12%
Train substitutes or replacements	8%
General administrative duties like maintenance incidents logs, reports, spare parts list, and shipping/receiving document	6%

Formal training

Formal training is another avenue for acquiring skills to perform the duties of an automation technician in Canada. Although formal training plays a smaller role than on the job training, Figure 6 shows that some skills are more likely acquired through formal training than others.

Figure 6   SKILLS LEARNED THROUGH FORMAL TRAINING

AT-specific skills	Formal training
Operate rigging equipment	34%
Operate man lifts and fork lifts	31%
The installation, assembly, testing, dismantling and packing of an automation system	28%
Program advanced cueing on an automation system	25%
Operate an automation system or console for a live show	21%
Ensure a safe workplace and compliance with regulations and codes (for example, fire, building, electrical, mechanical, environmental codes and regulations)	18%
Write technical documents	16%
Maintain and repair an automation system	15%
Determine maintenance needs of automation systems	14%
Create show cue sheets and record back-up of show cues	13%
Work at heights	12%
Provide technical expertise and advise during rehearsals and shows	11%
Practice theatre etiquette in a teamwork atmosphere	11%
Use and interpret non-verbal signals	6%

Figure 6 cont'd

General skills	Formal training
Operate conventional hand and/or power tools	15%
Communicate ideas effectively in oral or written form	14%
Operate a computer (includes installing software and firmware upgrades)	9%
Ability to prioritize, make decisions, and problem solve	8%
Train substitutes or replacements	8%
General administrative duties like maintenance incidents logs, reports, spare parts list, and shipping/receiving document	8%

Professional development: conferences / workshops

To gain insight into what alternative training such as conferences and workshops were available to automation technicians, **kisquared** asked respondents if they attended any conferences or workshops within the past year related to professional development in the field of automation. Figure 7 below shows that 30% of respondents have attended conferences or workshops within the past year.

Figure 7   PROFESSIONAL DEVELOPMENT IN AUTOMATION FIELD – CONFERENCE OR WORKSHOP ATTENDANCE
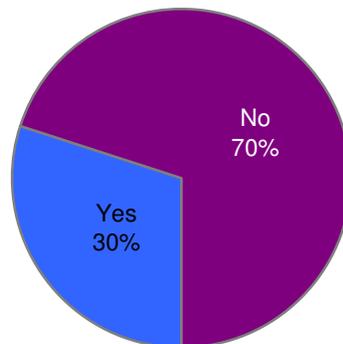
Note: Data derived from Q8.

Respondents who indicated they had attended such a conference or workshop were asked what skill or skill set it pertained to. Figure 9 below shows their responses, coded to match the list of AT-specific and general skills used in this study for easier comparison. (For verbatim responses to this question, please see Appendix A, Q8)

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Figure 8   PROFESSIONAL DEVELOPMENT – SKILL SET

AT-specific skills	%
Operate an automation system or console for a live show	31%
Maintain and repair an automation system	25%
Operate rigging equipment	16%
Ensure a safe workplace and compliance with regulations and codes	10%
Operate man lifts and fork lifts	6%
Work at heights	2%
General Skills	**%**
Communicate ideas effectively in oral or written from	4%

Note: Data derived from Q8.

Conference and workshop attendee respondents were also asked who offered this professional development training. Figure 9 below gives a breakdown of their responses.

Figure 9   PROFESSIONAL DEVELOPMENT – WHO OFFERED THE TRAINING?

CITT or USITT	53%
CITT	21%
CITT conference	12%
USITT	9%
USITT conference	7%
USITT and CITT	2%
General conference for theatre	2%
Other organizations	**12%**
Alberta Federation of Labour	2%
Automation technicians conference in Ottawa	2%
Canadian Country Music Awards	2%
Canadian Dance Assembly	2%
CHRC meeting	2%
IATSE	2%
Safe Stages at Theatre of Alberta	2%
Corporate training	**12%**
Chain Master	2%
Christie Lites	2%
Conference at Lighting Dimension International	2%
Manufacturers seminar	2%
Niscon (supplier) / Hoffend and Sons (supplier)	2%
Q1 Production Technologies	2%
Vari-Lite	2%

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Figure 9 cont'd

Don't know / not specifically stated	**23%**
Don't know	7%
Automation for the stage	2%
Fire safety	2%
Introduction to show control	2%
Lighting	2%
Lighting conference	2%
Open Space Rigging	2%
Rigging in non-traditional places	2%
Rigging seminar	2%
Rigging workshop in London	2%

Note: The total percentage does not equal 100% due to rounding. Data gathered from Q8.

- Figure 9 shows that 53% of respondents participated in professional development training through either CITT- or USITT-sponsored events, thus representing a major portion of professional development training.

- 12% of respondents participated in corporate training, which refers to training through workshops, conferences, or seminars offered by manufacturers and suppliers to the sector.

- Another 12% of respondents participated in professional development training sponsored by various other organizations.

- 23% could not recall or did not state who provided the training, only the type of training received.

- Finally, the professional development mentioned by respondents is not limited solely to the field of automation, but covers other roles that are also performed by automation technicians.

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Chart of competencies – validation

The skills assessed by the survey were modeled closely upon the chart of competencies developed by the CHRC. However, to objectively validate this range of competencies, respondents were asked if there are any additional skills needed for the job of automation technician that were not covered in the survey, or that might be required in future.

- Most survey respondents (82%) said the list of skills was not missing any required for automation technicians to perform their job, or that they could not think of any other skills (see Figure 10 below).

This is an important finding because it validates the CHRC chart of core competencies, and permits the conclusion that the chart comprehensively covers the range of skills required by automation technicians.

Of those who did mention a skill not covered by the initial chart of competencies:

- 7% felt that math / computer skills are important;

- 6% felt that safety / first aid is important, given the nature of the job;

- 5% felt that creativity and design are important; and

- 3% mentioned knowledge of legal rights.

Figure 10   PERTINENT SKILLS NOT COVERED BY SURVEY

Skill	%
No, I cannot think of any other skills	82%
Math / computer skills	7%
Safety / First Aid	6%
Creativity and design	5%
Welding / electrical skills	3%
Knowledge of legal rights	1%
Linguistic skills	1%

Note: Percentages exceed 100% because multiple responses were accepted. Data derived from Q9.

Learning skills in other ways

Respondents were asked how automation technicians might learn required skills to perform the duties of an automation technician, other than on the job, or through self-teaching or formal training.

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Almost half (45%) said they could not think of another way to learn the required skills other than the three methods mentioned. Nearly one-fifth (18%) mentioned workshops and seminars as another way to learn necessary skills; 12% pointed to corporate training, in which a manufacturer or supplier hosts a training event; and the same percentage cited mentoring programs as an alternative route to skills acquisition.

Figure 11 ALTERNATIVE TRAINING PATHS FOR AUTOMATION TECHNICIANS

	%
No, I can't think of other ways to learn the skills	45%
Workshops / seminars	18%
Corporate training	12%
Mentoring programs	12%
Informal or self-teaching	7%
Formal training	5%
Do not know	3%

Note: Data derived from Q10.

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Skills acquisition through formal training

When respondents indicated they either received or would expect to receive formal training to acquire a given skill, interviewers then asked where they received such training or where they would expect to get it. The name of the institution and the name and duration of the program were requested. Results are reproduced in full in Appendix D, and highlighted below. Training institutions have been grouped into three categories for analysis: AT-specific institutions (i.e., institutions that specifically offer training for automation technicians), universities and/or colleges (i.e., non-AT-specific institutions), and Other providers (such as in-house training or corporate training). Also shown in each Figure is the average (mean) duration of programs for that skill, broken out by type of institution.

AT-specific skills

Installation, assembly, testing, dismantling and packing of an automation system

Of 44 respondents for this skill area, 41% indicate they learned or would expect to learn how to install, assemble, test, dismantle and pack an automation system at AT-specific institutions (see Figure 12 below for details), and another 41% choose a general college and/or university to offer formal training for this skill. About one-fifth (18%) say this skill could be learned by means other than the first two. Malaspina University College and Ryerson University are the most frequently mentioned institutions that offer training for this particular skill (see Appendix D for further details). Respondents commonly cited their "theatre" and "technical theatre" programs, giving training durations averaging two to four years.

Figure 12   INSTALLATION, ASSEMBLY, TESTING, DISMANTLING AND PACKING OF AN AUTOMATION SYSTEM

Mean program duration:	
AT-specific insitiutions	2.6 years
Colleges/universities	3.0 years
Other	14 days
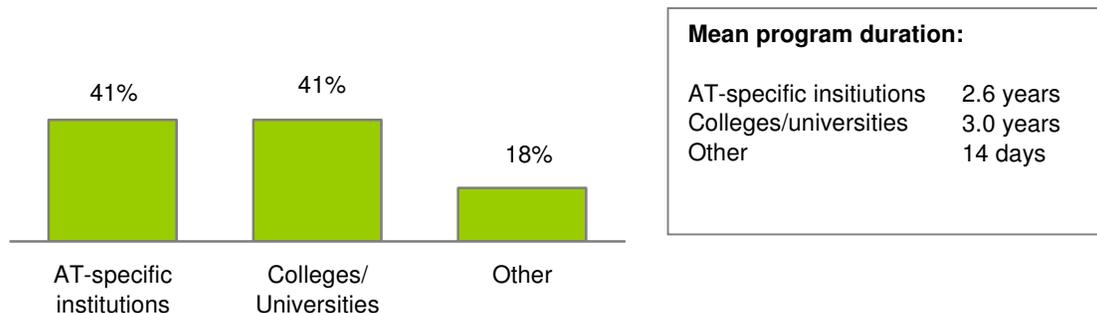
Programming advanced cueing on an automation system

Figure 13 below shows analysis of institutions offering training to program advanced cueing on an automation system. Of 37 respondents, 38% indicate they received or would expect to receive training for this skill at an AT-specific institution. Another 35% picked a college/university. About one-quarter (27%) say this skill could be learned through other means such as supplier training or corporate training. Malaspina University College and Red Deer College, with "technical theatre"

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programs lasting two years, are frequently mentioned. Also mentioned frequently is York University, with a "lighting" program lasting two years and a "theatre" program lasting four years.

Figure 13   PROGRAMMING ADVANCED CUEING ON AN AUTOMATION SYSTEM

Mean program duration:	
AT-specific insitiutions	2.1 years
Colleges/universities	3.4 years
Other	7.7 days
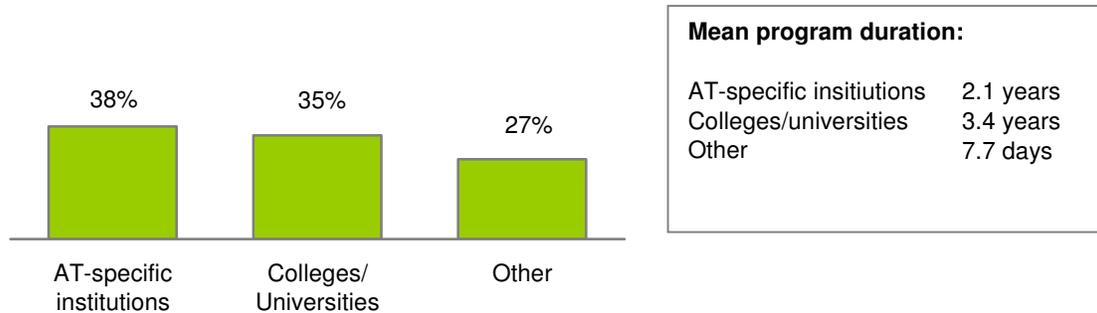
Operating an automation system or console for a live show

Of 35 responses given (see Figure 14), almost half (46%) pick universities and/or colleges for this training. Even more (49%) say this skill can be learned at AT-specific institutions. Two particular colleges are frequently mentioned: Douglas College, with a "Stagecraft" program lasting two years; and Red Deer College, with a "technical theatre" program also lasting two years. York University, with a "lighting" program (two years in duration) and a "theatre" program (four years) is a frequently mentioned university source for this training.

Figure 14   OPERATING AN AUTOMATION SYSTEM OR CONSOLE FOR A LIVE SHOW

Mean program duration:	
AT-specific insitiutions	2.5 years
Colleges/universities	3.2 years
Other	Negligible
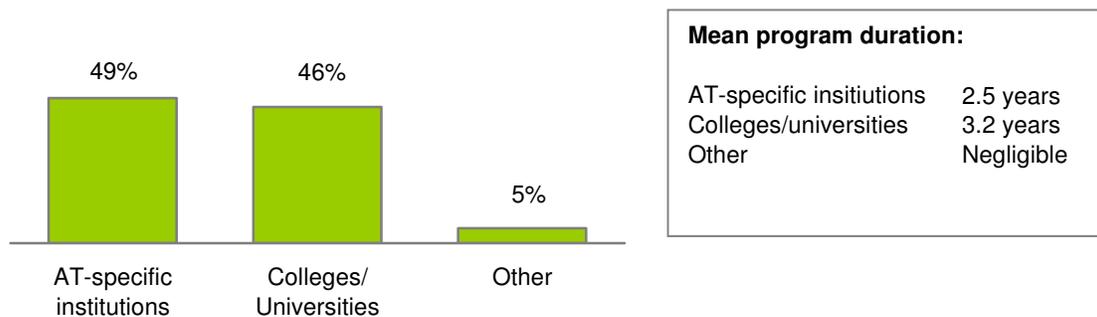
Determining maintenance needs of automation systems

Of 20 responses collected about training to determine maintenance needs of automation systems (see Figure 15 below), 45% indicate training received or expected at a college or university, while another 30% noted AT-specific institutions that offer such training. One-quarter of the responses (25%) indicate other sources of training. Red Deer College and its two-year "theatre" program are mentioned twice.

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Figure 15   DETERMINING MAINTENANCE NEEDS OF AUTOMATION SYSTEMS

Mean program duration:	
AT-specific insitiutions	2.0 years
Colleges/universities	2.6 years
Other	2 days
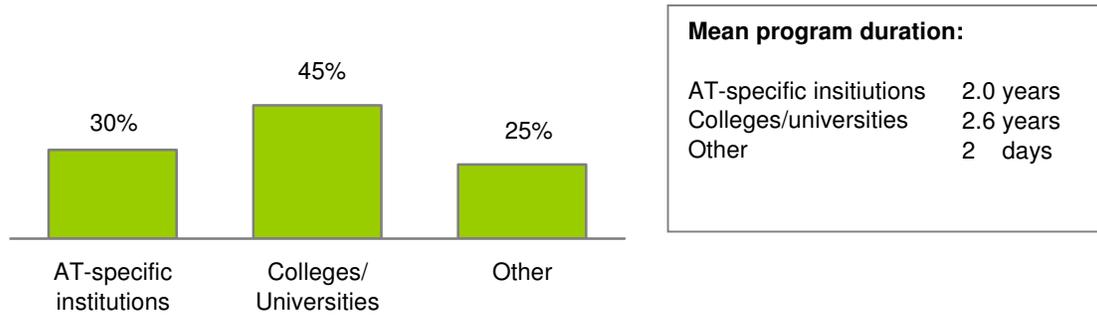
Maintaining and repairing an automation system

As Figure 16 shows, of 17 respondents, 35% learned or expect to learn how to maintain and repair an automation system at universities or colleges. Almost one-quarter (24%) indicate this skill was learned or could be learned at an institution offering AT-specific training. However, the largest proportions (41%) suggest other means to acquire this skill, such as workshops, suppliers and technical manuals.

Figure 16   MAINTAINING AND REPAIRING AN AUTOMATION SYSTEM

Mean program duration:	
AT-specific insitiutions	2.1 years
Colleges/universities	2.7 years
Other	2 days
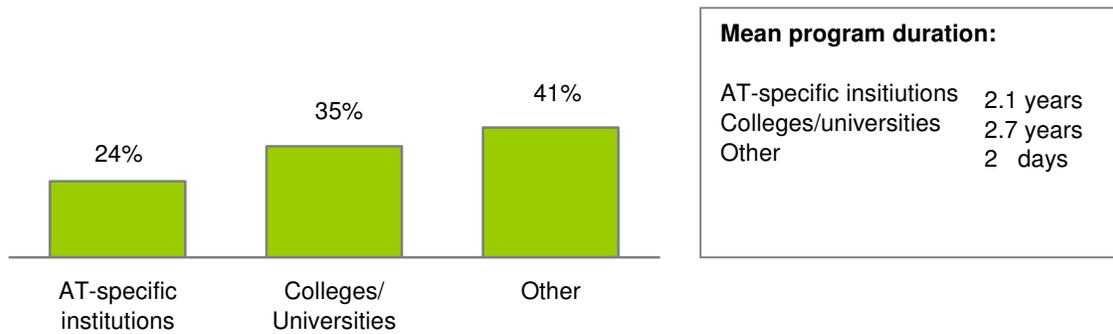
Providing technical expertise and advice during rehearsals and shows

A total of 19 responses were given by respondents as to where they learned or would expect to learn this skill (see Figure 17 below). Almost two-thirds (63%) indicate a university or college as their choice of institution, whereas one-third (33%) indicate an AT-specific institution. Only 5% of respondents cite other sources of training, such as technical manuals. Programs offered by the United States Institute for Theatre Technology (USITT) specifically are mentioned twice.

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Figure 17 **PROVIDING TECHNICAL EXPERTISE AND ADVICE DURING REHEARSALS AND SHOWS**

Mean program duration:	
AT-specific insitiutions	2.0 years
Colleges/universities	2.9 years
Other	Negligible
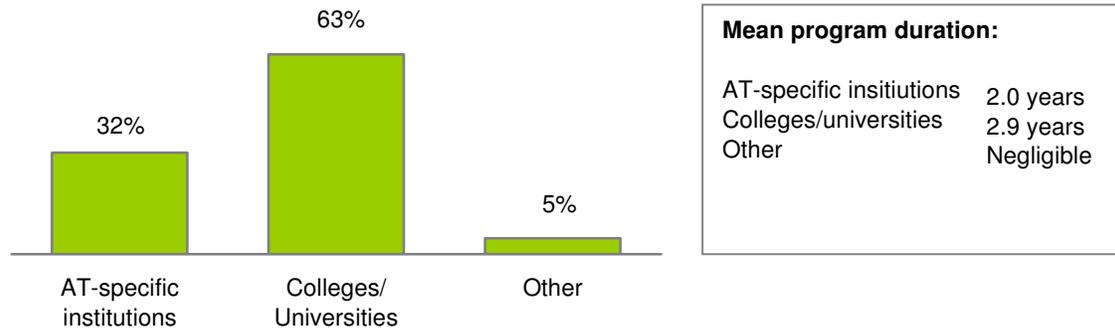
Creating show cue sheets and recording back-up of show cues

Twenty responses were collected as to where automation technicians can learn to create show cue sheets and record back-up of show cues. Almost half (45%) indicate universities and / or colleges as training sources for this particular skill, and another 40% suggest AT-specific institutions provide such training (see Figure 18). Fifteen percent note this skill could be learned in other ways, for example, through technical manuals. Douglas College with its two-year "Stagecraft" program is mentioned more frequently than other institutions.

Figure 18 **CREATING SHOW CUE SHEETS AND RECORDING BACK-UP OF SHOW CUES**

Mean program duration:	
AT-specific insitiutions	2.3 years
Colleges/universities	3.5 years
Other	2.5 days
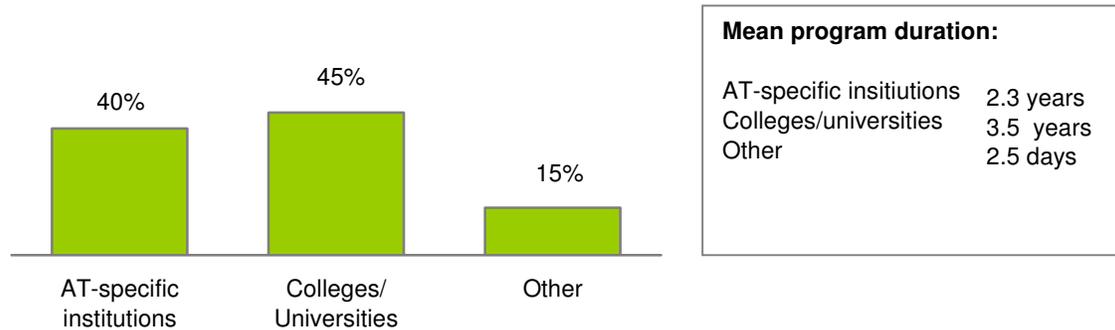
Writing technical documents

Figure 19 shows analysis of formal training offered in the area of technical writing. Of the 16 responses provided, slightly more than two-thirds (69%) point to universities or colleges as sources for training, while only 15% indicate an AT-specific institution. Seventeen percent suggest other ways of acquiring this skill.

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Figure 19   WRITING TECHNICAL DOCUMENTS

```
         56%
                      42%

  17%
```

AT-specific   Colleges/   Other
institutions   Universities

Mean program duration:	
AT-specific insitiutions	2.0 years
Colleges/universities	3.0 years
Other	2.5 days
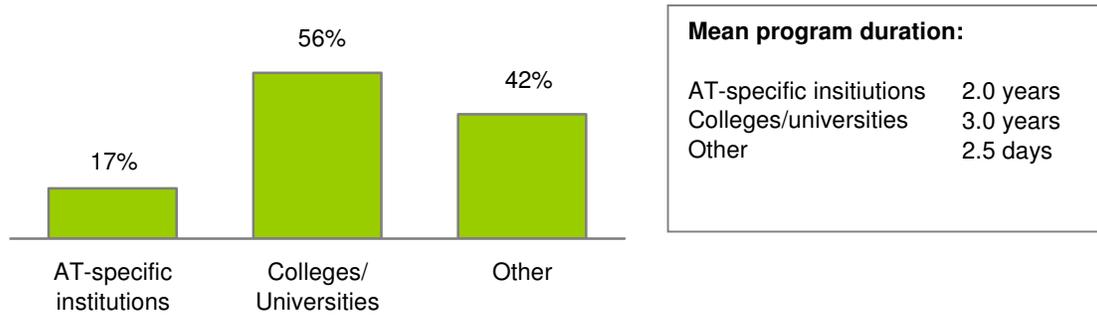
Ensuring a safe workplace and compliance with regulations and codes

As shown in Figure 20 below, to gain the necessary skills to ensure a safe workplace and compliance with regulations and codes, 41% respondents suggest formal training by way of theatre programs at a university/college, whereas 31% pick an AT-specific institution. Twenty-eight percent suggest other sources for this skill such as workplace training and the Workers Compensation Board. Red Deer College, York University, and Douglas College are mentioned more frequently than other institutions.

*Figure 20   ENSURING A SAFE WORKPLACE AND COMPLIANCE WITH REGULATIONS
                AND CODES*

```
                41%

  31%
                           28%
```

AT-specific   Colleges/   Other
institutions   Universities

Mean program duration:	
AT-specific insitiutions	2.3 years
Colleges/universities	4.0 years
Other	2 days
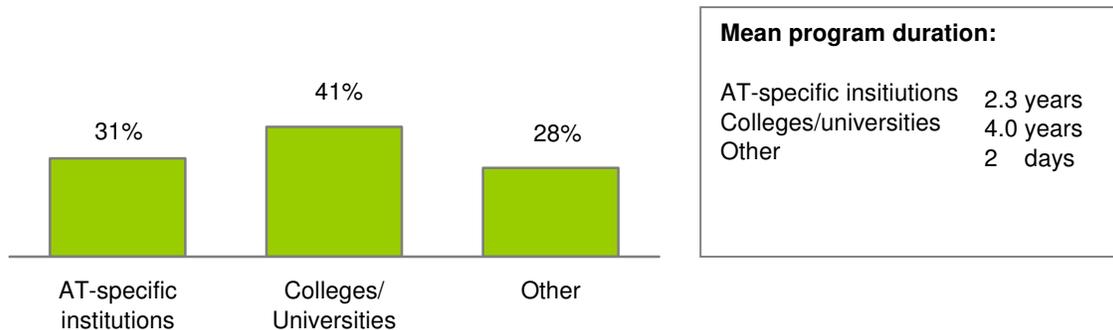
Operating rigging equipment

As shown below in Figure 21, of the 50 respondents, half (50%) identified AT-specific institutions as training sources to operate rigging equipment while only 28% identify universities or colleges for that purpose. Twenty-two per cent cite other ways of learning this skill, corporate training being frequently mentioned. Training institutions most frequently cited for this training include York University, Ryerson University, Red Deer College, Douglas College and Humber College.

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Figure 21   OPERATING RIGGING EQUIPMENT

50%

28%

22%

AT-specific
institutions

Colleges/
Universities

Other

Mean program duration:

AT-specific insitiutions   2.1 years
Colleges/universities   3.5 years
Other   2.9 days
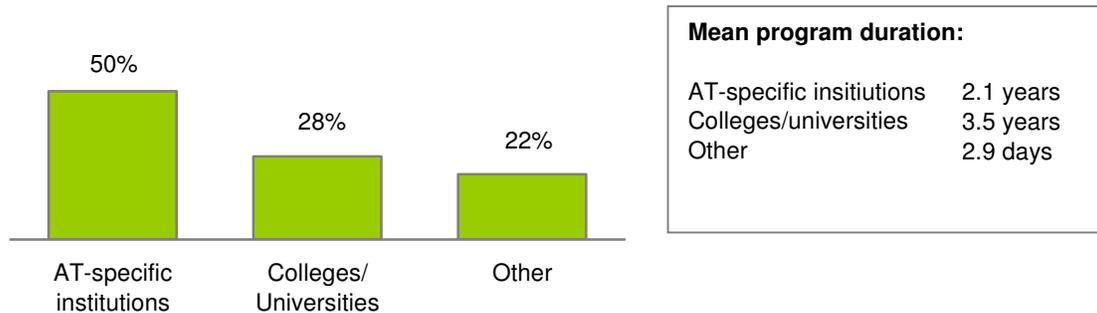
Operating man lifts and fork lifts

Figure 22, below, shows where respondents developed or expect to develop skills to operate man lifts and fork lifts. Of 43 responses provided, slightly than one-quarter (28%) say this skill could be learned at AT-specific institutions, but more than half point to other ways of learning this skill, including workshops and corporate training as being the main provider of training. Slightly more For the most part, workshops or demonstrations are completed in several hours or up to one week. Only 14% suggest general university or college courses, such as theatre production and technical theatre (often from two to four years in length), as training sources for this skill. Frequently mentioned training institutions for this skill include Ryerson University, Red Deer College and Douglas College.

Figure 22   OPERATING MAN LIFTS AND FORK LIFTS

58%

28%

14%

AT-specific
institutions

Colleges/
Universities

Other

Mean program duration:

AT-specific insitiutions   2.6 years
Colleges/universities   3.3 years
Other   2.5 days
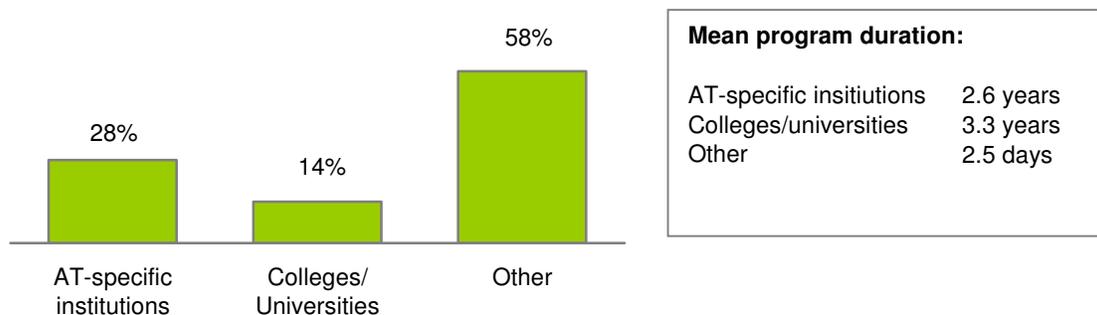
Using and interpreting non-verbal signals

Only ten respondents provided data about where they received or expect to receive training to use and interpret non-verbal signals. As shown in Figure 23 below, half (50%) cite training offered at universities or colleges, while 40% suggest AT-specific training institutions. Douglas College and York University are mentioned several times as sources for training.

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Figure 23   USING AND INTERPRETING NON-VERBAL SIGNALS

Mean program duration:	
AT-specific insitiutions	2.7 years
Colleges/universities	3.3 years
Other	Negligible
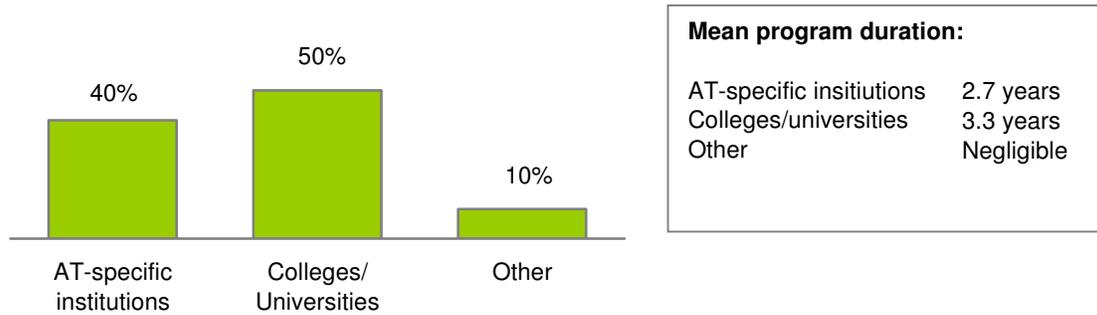
Practising theatre etiquette in a teamwork atmosphere

Regarding this skill, 60% of respondents indicate university or colleges as a training source, while 30% opt for training offered by AT-specific institutions. Only 10% suggest any other training method. Most programs are general and lengthy in duration; however, there are shorter courses offered by Mount Royal College and Fanshawe College. Ryerson University and York University are mentioned more frequently than other training institutions.

Figure 24   PRACTISING THEATRE ETIQUETTE IN A TEAMWORK ATMOSPHERE

Mean program duration:	
AT-specific insitiutions	3.3 years
Colleges/universities	3.6 years
Other	Negligible
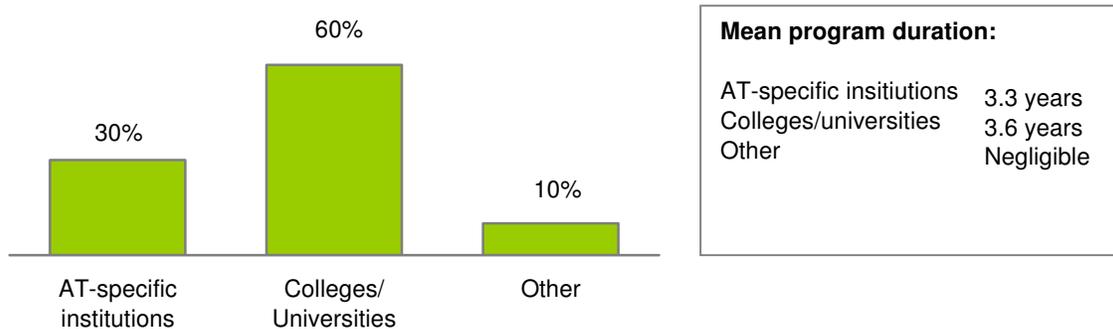
Working at heights

Of 21 respondents, 43% indicated they learned or would expect to learn to work at heights from a university or college, while another 33% suggest institutions offering AT-specific training (see Figure 25). Almost one-quarter (24%) say this skill can be acquired in other ways, such as through the Canadian Standards Association and workshops. The Canadian Institute for Theatre Technology (CITT) and the International Alliance of Theatrical Stage Employees (IATSE) are cited several times as training sources to get automation technicians working at heights.

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Figure 25   WORKING AT HEIGHTS

Mean program duration:	
AT-specific insitiutions	3.3 years
Colleges/universities	2.5 years
Other	Negligible
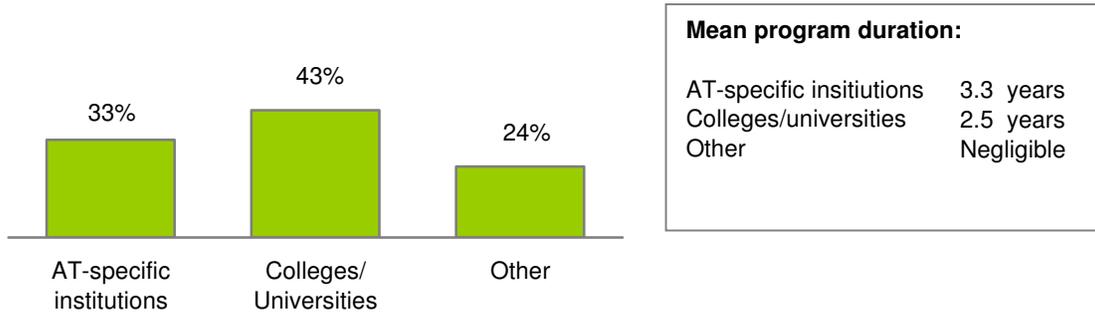
General skills

Operating a computer including software installation and firmware upgrades

Figure 26 below shows formal training for operating a computer (including software installation and firmware updates). Of 15 respondents, 52% suggest training at university or college, whereas 20% cite an AT-specific institution. Slightly more than one-quarter (27%) indicate this skill could be learned in other ways, including technical manuals and in-house training. Four respondents identified high school or CEGEP courses as a source for this skill.

Figure 26   OPERATING A COMPUTER INCLUDING SOFTWARE INSTALLATION AND FIRMWARE UPGRADES

Mean program duration:	
AT-specific insitiutions	2.7 years
Colleges/universities	3.6 years
Other	2.5 days
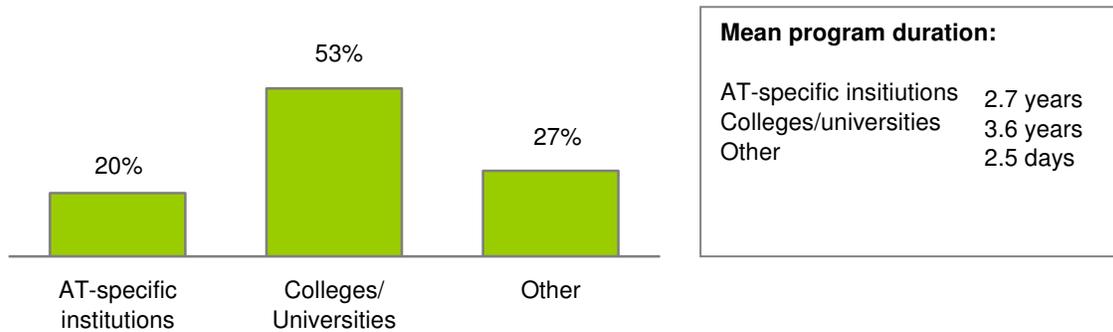
General administrative duties

Only 11 responses were given by respondents regarding institutions which offer training for general administrative duties like maintenance incident logs, reports, spare parts lists, and shipping/receiving documents. Almost half (46%) say universities or colleges are sources for training, while 27% prefer an AT-specific institution for this training (see Figure 27 below). Another 27% say general administrative skills could be acquired in other ways, such as in-house training. Douglas College is mentioned twice as a training outlet for general administrative duties.

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Figure 27   GENERAL ADMINISTRATIVE DUTIES

46%

27%   27%

Mean program duration:	
AT-specific insitiutions	2.0 years
Colleges/universities	3.7 years
Other	2 days

AT-specific   Colleges/   Other
institutions   Universities
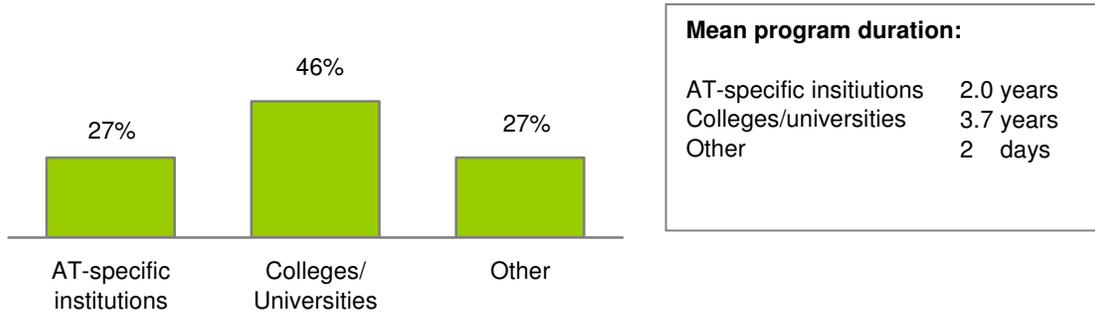
Operating conventional hand and/or power tools

Figure 28 shows formal training preferences regarding institutions that give training in operating conventional hand and/or power tools. Of 27 responses, almost two-thirds (63%) indicate that they learned or would expect to learn that skill at a university or college. Only 22% think this skill should be acquired at an institution offering AT-specific training, and just 15% think it is learned or could be learned in other ways, such as through high school.

Figure 28   OPERATE CONVENTIONAL HAND AND / OR POWER TOOLS

63%

22%

15%

Mean program duration:	
AT-specific insitiutions	2.8 years
Colleges/universities	3.4 years
Other	Negligible

AT-specific   Colleges/   Other
institutions   Universities
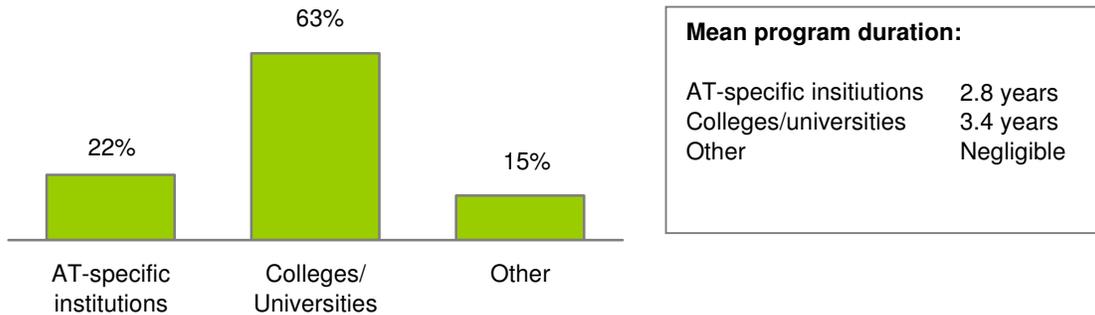
Ability to prioritize, make decisions, and problem solve

Figure 29 below shows the relative proportions of respondents regarding where they learned, or expect to learn, how to prioritize, make decisions and solve problems. Of these responses, 71% note universities or colleges as training source in this area, while another 21% suggest AT-specific institutions. Only 7% indicate other possible ways of learning this skill.

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Figure 29   ABILITY TO PRIORITIZE, MAKE DECISIONS, AND PROBLEM SOLVE

Mean program duration:	
AT-specific insitiutions	3.3 years
Colleges/universities	3.0 years
Other	Negligible
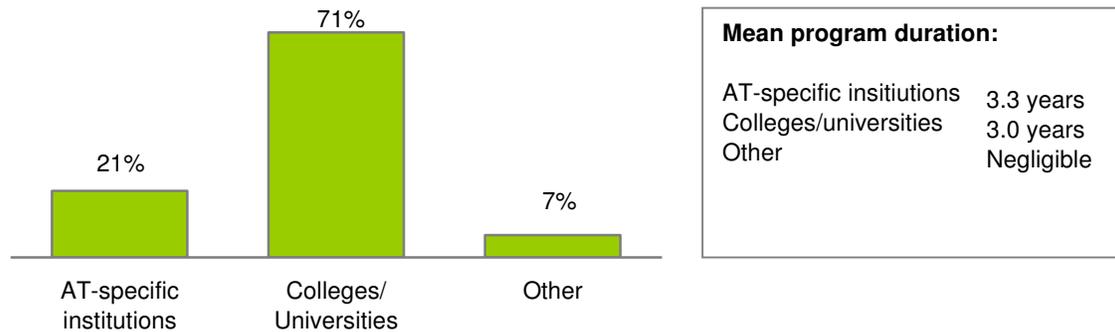
Communicating ideas effectively in oral or written form

Figure 30 shows formal training resources on how to communicate ideas effectively in oral and written form. Of the 25 respondents, 52% point to general courses provided by universities or colleges, with program duration ranging between 10 months and four years. Slightly more than one-quarter (28%) of respondents say this skill could be learned at AT-specific institutions. Unlike other skills, there were few mentions of workshops or in-house training; but one-fifth (20%) still note this skill can be learned in other ways. Frequently mentioned training institutions for this skill include Ryerson University, University of Calgary and York University.

Figure 30   COMMUNICATING IDEAS EFFECTIVELY IN ORAL OR WRITTEN FORM

Mean program duration:	
AT-specific insitiutions	3.0 years
Colleges/universities	3.8 years
Other	0.5 years
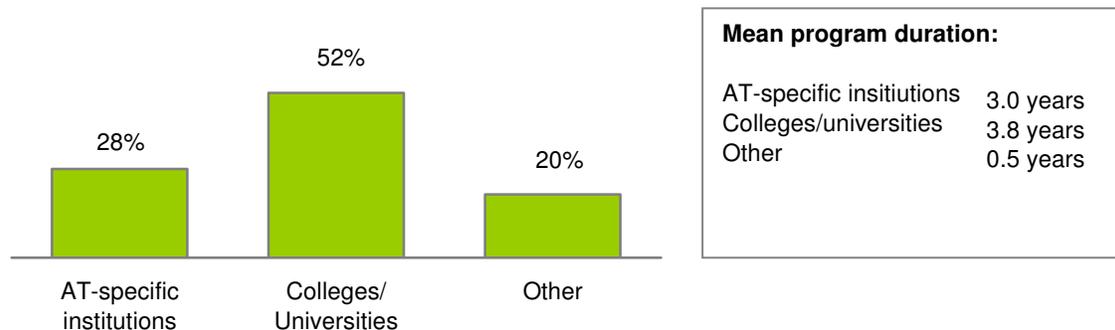
Training substitutes or replacements

Twelve responses were given as to where respondents learned or expect to learn how to train substitutes or replacements. Of these, half (50%) mention colleges or universities as training sources, whereas one-third (33%) indicate an AT-specific institution (see Figure 31). Seventeen per cent note this skill is or could be learned through other means.

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Figure 31   TRAINING SUBSTITUTES OR REPLACEMENTS

Mean program duration:	
AT-specific insitiutions	2.7 years
Colleges/universities	3.8 years
Other	Negligible

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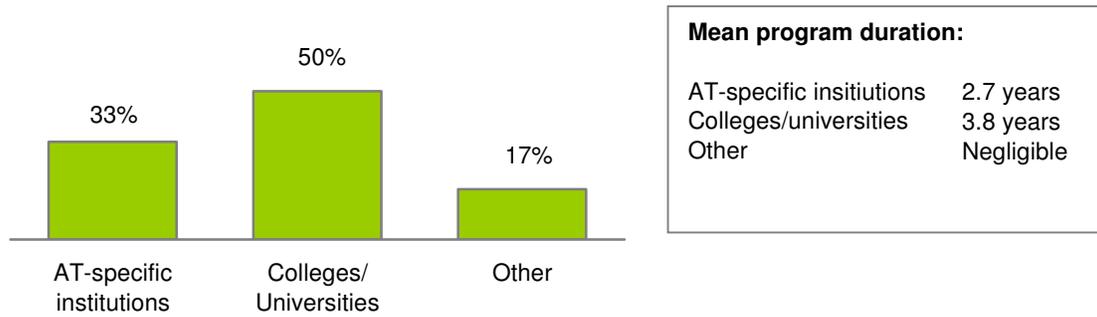
Training gaps analysis

Training gaps were analyzed, based on the training needs expressed by automation technicians and those who employ them. Figure 32, below, shows the skills gap, which is the percentage who say an AT-specific skill is needed. Expectations as to where that skill will be acquired (by those who need it) are shown in the three right-most columns.

For every skill assessed, at least 50% of respondents cited on the job training as a means by which they expect skills to be acquired. For only two skills – operating man lifts and fork lifts, and working at heights – did less than 75% of respondents say that training needs would be met through on the job training. The overall finding is that on the job training is important for the development of all AT-specific skills.

The roles of self-teaching and formal training are less consistent, as Figure 32 also shows. Of those facing a skills gap, at least 20% cited self-teaching as a way to learn to use and interpret non-verbal signals, to ensure a safe workplace and compliance to regulations and codes, and to operate rigging equipment. For other skills, self-teaching is less commonly expected.

The role of formal training also appears to be quite important for some skills and not important for others. Formal training in skills potentially affecting personal safety appears important: it is most commonly expected for operating man lifts and fork lifts (67%), working at heights (50%), and operating rigging equipment (40%). In AT-specific technical and diagnostic skills (determining maintenance needs of automation systems; installing, assembling, testing, dismantling, and packing an automation system; maintaining and repairing an automation system; and providing technical expertise and advice during rehearsals and shows), formal training is expected by approximately one-third of those who need each skill. Formal training is expected to play a much smaller role for most other skills.

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Figure 32   SKILLS GAPS AND PERCEPTION OF HOW EACH WILL BE FILLED

AT-specific skills	Skills gap	Expectation of how skills gap will be filled		
		On the job	Self-taught	Formal training
Program advanced cueing on automation system	20%	86%	14%	19%
Determine maintenance needs of automation systems	13%	80%	5%	35%
Install, assemble, test, dismantle, pack automation system	13%	100%	13%	33%
Maintain and repair automation system	9%	86%	7%	29%
Operate automation system or console for live show	7%	92%	8%	8%
Ensure safe workplace and compliance with regulations, codes	6%	75%	25%	25%
Write technical documents	5%	75%	13%	25%
Operate man lifts and fork lifts	4%	50%	0%	67%
Operate rigging equipment	3%	80%	20%	40%
Create show cue sheets and record back-up of show cues	3%	100%	0%	0%
Use and interpret non-verbal signals	3%	100%	33%	0%
Provide technical expertise and advice during rehearsals and shows	3%	83%	0%	33%
Work at heights	2%	50%	0%	50%
Practice theatre etiquette in a teamwork atmosphere	2%	100%	0%	0%
General skills				
General administrative duties	5%	100%	0%	0%
Communicate ideas effectively in oral or written form	5%	90%	0%	10%
Ability to prioritize, make decisions and problem solve	4%	100%	0%	0%
Operate computer incl. software installation, firmware upgrades	4%	86%	0%	14%
Train substitutes or replacements	3%	100%	0%	20%
Operate conventional hand and/or power tools	1%	100%	0%	0%

Note: Percentages shown under "Expectation of how skills gap will be filled" are derivations of the percentage shown under "Skills gap" (i.e., those identifying the skill as one that they need). Right-hand column percentages exceed 100% because multiple responses were accepted.

Figure 33 below shows, for each skill, the skills gap and the percentage of those expecting the gap to be addressed through formal training (the same data shown in Figure 32 above). Figure 33 also shows, for each skill, the number of educational institutions providing AT-specific training or programs to meet that training need (out of a total of 18). Comparing skills gap percentages

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and formal training expectations with the prevalence of formal training for each skill allows us to assess whether educational institutions are offering the formal training needed to fill skills gaps.

Most AT-specific skills are taught by a majority of the 18 institutions interviewed. Three skills that are *not* generally taught pertain to AT-specific problem-solving and technical expertise: determining maintenance needs of automation systems (offered by only 5 out of 18 institutions); installing, assembling, testing, dismantling, and packing an automation system (5 out of 18 institutions); and maintaining and repairing an automation system (3 out of 18 institutions). These represent the second, third and fourth largest skills gaps – and about one-third of those needing each skill expect it to be addressed through formal training. These findings suggest that institutions are not offering the formal AT-specific technical and diagnostic training required to close those gaps.

AT-specific technical writing skills were offered by none of the 18 institutions interviewed, despite a skills gap of 5% and an expectation by 25% of those who need that skill that formal training will be the way they acquire it. This data suggests technical writing skills are developed elsewhere before being transferred to AT-specific applications.

Figure 33 ANALYSIS: SKILLS GAPS, TRAINING WANTED, INSTITUTIONAL OFFERINGS

AT-specific skills	Skills gap	Address through formal training?	Count of institutions offering (of 18)
Program advanced cueing on automation system	20%	19%	10
Determine maintenance needs of automation systems	13%	35%	5
Install, assemble, test, dismantle, pack automation system	13%	33%	5
Maintain and repair automation system	9%	29%	3
Operate automation system or console for live show	7%	8%	13
Ensure safe workplace and compliance with regulations, codes	6%	25%	18
Write technical documents	5%	25%	0
Operate man lifts and fork lifts	4%	67%	13
Operate rigging equipment	3%	40%	16
Create show cue sheets and record back-up of show cues	3%	0%	18
Use and interpret non-verbal signals	3%	0%	14
Provide technical expertise and advice during rehearsals and shows	3%	33%	14
Work at heights	2%	50%	17
Practise theatre etiquette in a teamwork atmosphere	2%	0%	18
General skills			
General administrative duties	5%	0%	-
Communicate ideas effectively in oral or written form	5%	10%	-
Ability to prioritize, make decisions and problem solve	4%	0%	-
Operate computer incl. software installation, firmware upgrades	4%	14%	-

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Train substitutes or replacements	3%	20%	-
Operate conventional hand and/or power tools	1%	0%	-

Note: Percentages shown under "Formal training" are derivations of the percentage shown under "Skills gap".

Programming advanced cueing on automation systems

A skills gap of 20% exists for automation technicians in their ability to program advanced cueing on automation systems. Of all the skills probed in the survey, this is largest skills gap, and 19% of respondents who have a training need in this area feel it should be addressed through formal training.

Of the 18 interviews conducted with institutions that offer formal AT-specific training, 10 offer training in programming advanced cueing on automation systems (see Figure 34 to Figure 37). One institution in B.C., University College of the Fraser Valley, offers this training, while Alberta has three providing such training, namely, Grant MacEwan College, Keyano College and Mount Royal College. In Ontario, Redeemer University College and Humber College provide training for this specific skill. In Québec, John Abbott College, Cégep de Saint-Hyacinthe, Collège Lionel-Groulx and National Theatre School of Canada provide this training.

Although ten institutions provide formal training in programming advanced cueing on automation systems, regional differences are evident, with little formal training available to automation technicians in the Prairies, the Maritimes, and the North. More training opportunities specific to automation technicians are available in the West (B.C. and Alberta) and Central Canada (Ontario and Québec). The concentration of formal training opportunities in only some provinces means that automation technicians in the Prairies, the Maritimes and the North do not have the same access to training.

Determining maintenance needs of automation systems

A 13% skills gap exists in connection with the ability to determine the maintenance needs of automation systems, which is the second largest gap of the 20 skills explored in this study. Of those respondents who need this skill, 35% indicate formal training as their preferred route.

From the interviews conducted with institutions offering AT-specific training, it was found that only five (out of 18) offer training in determining the maintenance needs of automation systems (see Figure 34 to Figure 37). Keyano College and Mount Royal College in Alberta offer training for this skill while Redeemer University College and Cambrian College in Ontario do the same. In Québec, only the National Theatre School of Canada provides this training.

Again, regional training differences are evident, in that B.C. does not have an institution providing formal training specific to determining the maintenance needs of automation systems, nor do the Prairies, the Maritimes or the North. This is a noteworthy training gap, as the training need is substantial in comparison to geographically limited training offerings.

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Installation, assembly, testing, dismantling, packing automation system

A skills gap of 13% exists for automation technicians in their ability to install, assemble, test, dismantle, and pack an automation system, and representing the second largest skills gap in this study. Of these respondents with a training need, 33% feel formal training would address their need.

Five institutions provide training on how to install, assemble, test, dismantle, and pack an automation system, namely, Sheridan College and Cambrian College in Ontario, and Grant MacEwan College, Keyano College and Mount Royal College in Alberta. Although five different institutions provide this training, they are located in only two provinces, meaning regional differences in access to formal training for this skill are substantial. Again, this suggests a noteworthy training gap, given a sizeable training need coupled with limited training offerings, particularly in certain geographic regions of Canada.

Maintaining and repairing automation system

A 9% skills gap exists in connection with the maintenance and repair of automation systems, which represents the fourth largest skills gap in this study. Twenty-nine per cent of respondents needing this skill want formal training to acquire it.

Although this is the fourth largest skills gap, only three formal training institutions provide training on how to maintain and repair an automation system, all located in Ontario: Redeemer University College, Sheridan College and Humber College. This indicates a need for more formal training in this skill in other provinces.

Respondents were asked whether they have attended a conference or workshop related to professional development in the past year; one-quarter of those who did so mentioned training that pertained to maintaining and repairing an automation system. This suggests that a training gap exists, but that some are seeking to close it through less formal training offered at workshops and conferences.

Operating automation system or console for live show

The gap (or need) for this skill is moderate when compared to the other 13 AT-specific skills: 7% say that they are in need of this skill, while the need for the other skills ranges from 2% to 20%.

Of the 7% of respondents who need this skill, only 8% expect to acquire it through formal training. Eight percent expect this skill to be self-taught, and 92% believe it will be learned on the job.

Despite this, formal training covering the operation of an automation system or console for a live show is available at 13 of the 18 educational institutions interviewed. These are: Douglas College, Malaspina University College, and University College of the Fraser Valley in B.C.; Keyano College and Mount Royal College in Alberta; Redeemer University College, Sheridan College, Humber College, and Cambrian College in Ontario; and John Abbott College, Cégep de Saint Hyacinthe, Collège Lionel-Groulx, and National Theatre School of Canada in Québec.

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These institutions serve the four most populous provinces of Canada. Those living in other regions would likely have to relocate to one of these four provinces for formal training that develops this skill.

All respondents were asked if they have attended any conferences or workshops in the past year related to professional development in the field of automation. Of the 30% who answered yes, 31% experienced conference or workshop training in the operation of an automation system or console for live show.

Ensuring safe workplace and compliance with regulations, codes

The gap (or need) for this skill is moderate to low when compared to the other 13 AT-specific skills: 6% say that they are in need of this skill, while the need for the other skills ranges from 2% to 20%.

Programs developing the ability to ensure a safe workplace and compliance with codes and regulations are available at all 18 of the educational institutions examined (see Figure 34 through Figure 37). These institutions cover the four most populous provinces of Canada. Those living in other regions would likely have to relocate to one of these four provinces to obtain formal training that develops this skill.

All respondents were asked if they have attended any conferences or workshops in the past year related to professional development in the field of automation. Of the 30% answering yes, 10% experienced conference or workshop training in ensuring workplace safety and compliance with codes and regulations.

Writing technical documents

The skills gap in technical document writing is 5%. Of those who need this skill, three-quarters expect to acquire it through on the job training, and 13% believe it will be self-taught. Twenty-five percent expect formal training to play a role in closing this gap.

Formal programs that develop skill in writing technical documents are available at none of the 18 educational institutions examined. This means that those seeking formal training in this skill as it relates to automation technicians will not be able to do so at any AT-specific programs.

As well as scarcity in AT-specific formal training for this skill, there is also no mention of workshops or conferences being organized to provide training. Of the 30% who have attended a conference or workshop related to professional development in the past year, none described their conference or workshop as geared toward developing skill in writing technical documents. It appears that there is no substantial demand for formal training in this area; but rather, that writing technical documents is a skill expected (and most likely) to be honed on the job.

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Operating man lifts and fork lifts

Only 4% identified operating man lifts (i.e., person lifts) and fork lifts as a skill gap. However, of this 4%, two-thirds see formal training as the way they expect to acquire that skill. One-half think that on the job training or experience would address this skill gap.

Program offerings to develop the skill of operating man lifts and fork lifts are available at 13 of the 18 educational institutions examined. These include: Douglas College and Malaspina University College in B.C.; the Banff Centre and Mount Royal College in Alberta; Redeemer University College, Ryerson University, Sheridan College, Humber College, and Cambrian College in Ontario; and John Abbott College, Cégep de Saint Hyacinthe, Collège Lionel-Groulx, and National Theatre School of Canada in Quebec.

These institutions cover the four most populous provinces. Those living in other regions of Canada would likely have to travel to one of these four provinces to obtain formal training that develops this skill.

All respondents were asked if they have attended any conference or workshop related to professional development in the field of automation. Of the 30% answering yes, 6% say their conference or workshop had training on how to operate man lifts and fork lifts.

Operating rigging equipment

The gap for this skill is low when compared to other AT-specific skills: only 3% of respondents indicate that they are in need of this skill, while the other skills gaps range from 2% to 20 %.

Of the 3% who need this skill, 40% expect to learn it through formal training, 20% expect the skill to be acquired through self-teaching, and 80% expect it to be learned on the job.

Formal training covering the operation of rigging equipment is available at 16 out of the 18 institutions examined. These include: Douglas College, Langara College, and the University College of the Fraser Valley in B.C.; the Banff Centre, Grant MacEwan College, Keyano College, and Mount Royal College in Alberta; Redeemer University College, Ryerson University, Sheridan College, Humber College, and Cambrian College in Ontario; and John Abbott College, Cégep de Saint Hyacinthe, Collège Lionel-Groulx, and the National Theatre School of Canada in Quebec.

These institutions serve the four most populous provinces in Canada. Of the institutions examined, only Malaspina University College in B.C. and Red Deer College in Alberta do *not* offer training in this skill. Automation technicians in the Prairies, Atlantic Canada, or in the North, would have to travel to one of these four "have" provinces to receive formal training for this skill.

All respondents were asked if they have attended any conference or workshop in the past year related to professional development in the field of automation. Of the 30% answering yes, 16% indicated that the conference or workshop they attended provided training pertaining to operating rigging equipment.

Creating show cue sheets and recording backup of show cues

The gap for this skill is low when compared to the other AT-specific skills: only 3% indicate that they are need this skill, where other skills gaps range from 2% to 20%.

Of that 3%, all respondents expect to acquire this skill on the job, and none of them expect to acquire it through formal training.

Nonetheless, formal training in creating show cue sheets and recording backups of show cues is available at all 18 out of the 18 institutions examined (see Figure 34 through to Figure 37 for details). These institutions serve the four most populous provinces in Canada..

All respondents were asked if they have attended any conference or workshop in the past year related to professional development in the field of automation. Of the 30% answering yes, none indicated that they had had professional development pertaining to this skill.

Using and interpreting non-verbal signals

The need for this skill is low in comparison to other AT-specific skills: only 3% of respondents say they are in need of this skill, whereas other skills gaps range from 2% to 20%.

Of the 3% who need this skill, all of the respondents expect to that this skill will be acquired on the job, and 33% further believe that it will be self-taught. None of the respondents who indicate they need the skill expect to acquire it through formal training.

Still, formal training in using and interpreting non-verbal signals is available at 14 out of the 18 institutions examined. These are: Malaspina University College and the University College of the Fraser Valley in B.C; the Banff Centre, Grant MacEwan College, Keyano College, and Mount Royal College in Alberta; Ryerson University, Sheridan College, Humber College, and Cambrian College in Ontario; and John Abbott College, Cégep de Saint Hyacinthe, Collège Lionel-Groulx, and the National Theatre School of Canada in Quebec. These institutions serve the four most populous provinces in Canada.

All respondents were asked if they have attended any conference or workshop in the past year related to professional development in the field of automation. Of the 30% answering yes, none indicated that they had had professional development pertaining to this skill.

Providing technical expertise and advice during rehearsals and shows

The gap for this skill is low when compared to the other AT-specific skills: again, only 3% say they are in need of this skill, whereas other skills gaps range from 2% to 20%.

Of the 3% of respondents who need this skill, 83% expect that to acquire it on the job, and 33% expect to get it through formal training

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Formal training in providing technical expertise and advice during rehearsals and shows is available at 14 out of the 18 institutions examined. These are: Douglas College, Malaspina University College and the University College of the Fraser Valley in B.C.; Grant MacEwan College, Keyano College, Mount Royal College and Red Deer College in Alberta; Redeemer University College, Ryerson University, Sheridan College, Humber College, and Cambrian College in Ontario; as well as John Abbott College and the National Theatre School of Canada in Quebec.

All respondents were asked if they have attended any conference or workshop in the past year related to professional development in the field of automation. Of the 30% answering yes, none indicated that they had had professional development pertaining to this skill.

Working at heights

Working at heights is one of the smallest skills gaps, at 2%, most likely because of the considerable amount of formal training available.

Of 18 institutions interviewed, 17 offer working at heights as part of their theatre curriculum. Institutions that cater to this skill can be found in British Columbia, Alberta, Ontario and Quebec. Of note, only the University College of Fraser Valley, in British Columbia, indicated that it does not train students in this area. Formal training for this specific skill is not offered in the Prairies, the Maritimes or the North.

Exactly one-half of those who needed this skill thought that formal training should be available for it, while the other half expected training to take place on the job. Two percent of the respondents who have attended automation technician professional development workshops or conferences in the past year did so to develop this skill.

Practising theatre etiquette in a teamwork atmosphere

All 18 institutions provide instruction on theatre etiquette in a teamwork atmosphere. Not surprisingly, a very small gap exists for this skill (2%).

Programs that deal directly with theatre etiquette can be found in British Columbia, Alberta, Ontario and Quebec, but again no specific programs for automation technicians are located in the Prairies, the Maritimes or the North.

Curiously, although theatre programs universally train their students in this area, 100% of respondents expected this training to take place on the job. Perhaps many respondents failed to consider that the majority of theatre programs promote or even require student participation in college / university or local productions, which would foster this skill enormously.

Figure 34   BRITISH COLUMBIA – FORMAL SKILL OFFERINGS

	Douglas College	Langara College	Malaspina University College	University College of the Fraser Valley
Practice theatre etiquette in a teamwork atmosphere	✓	✓	✓	✓
Work at heights	✓	✓	✓	
Ensure a safe workplace and compliance with regulations and codes	✓	✓	✓	✓
Provide technical expertise	✓		✓	✓
Use and interpret non-verbal signals			✓	✓
Create show cue sheets and record back-up of show cues	✓	✓	✓	✓
Operate automation system or console for live shows	✓		✓	✓
Operate rigging equipment	✓	✓		✓
Install, assemble, test, dismantle and pack automation systems				
Operate man lifts and fork lifts	✓		✓	
Determine maintenance needs for automation systems				
Program advanced cueing on automation systems				✓
Maintain and repair automation systems				
Write technical documents				

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Figure 35   ALBERTA – FORMAL SKILL OFFERINGS

	The Banff Centre	Grant MacEwan	Keyano College	Mount Royal College	Red Deer College
Practice theatre etiquette in a teamwork atmosphere	✔	✔	✔	✔	✔
Work at heights	✔	✔	✔	✔	✔
Ensure a safe workplace and compliance with regulations and codes	✔	✔	✔	✔	✔
Provide technical expertise		✔	✔	✔	✔
Use and interpret non-verbal signals	✔	✔	✔	✔	
Create show cue sheets and record back-up of show cues	✔	✔	✔	✔	✔
Operate automation system or console for live shows			✔	✔	
Operate rigging equipment	✔	✔	✔	✔	
Install, assemble, test, dismantle and pack automation systems		✔	✔	✔	
Operate man lifts and fork lifts	✔			✔	
Determine maintenance needs for automation systems			✔	✔	
Program advanced cueing on automation systems		✔	✔	✔	
Maintain and repair automation systems					
Write technical documents					

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Figure 36   ONTARIO – FORMAL SKILL OFFERINGS

	Redeemer University College	Ryerson University	Sheridan College	Humber College	Cambrian College
Practice theatre etiquette in a teamwork atmosphere	✓	✓	✓	✓	✓
Work at heights	✓	✓	✓	✓	✓
Ensure a safe workplace and compliance with regulations and codes	✓	✓	✓	✓	✓
Provide technical expertise	✓	✓	✓	✓	✓
Use and interpret non-verbal signals		✓	✓	✓	✓
Create show cue sheets and record back-up of show cues	✓	✓	✓	✓	✓
Operate automation system or console for live shows	✓		✓	✓	✓
Operate rigging equipment	✓	✓	✓	✓	✓
Install, assemble, test, dismantle and pack automation systems			✓		✓
Operate man lifts and fork lifts	✓	✓	✓	✓	✓
Determine maintenance needs for automation systems	✓				✓
Program advanced cueing on automation systems	✓			✓	
Maintain and repair automation systems	✓		✓	✓	
Write technical documents					

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Figure 37   QUEBEC – FORMAL SKILL OFFERINGS

	John Abbott College	Cégep de Saint Hyacinthe	Collège Lionel-Groulx	National Theatre School of Canada
Practice theatre etiquette in a teamwork atmosphere	✓	✓	✓	✓
Work at heights	✓	✓	✓	✓
Ensure a safe workplace and compliance with regulations and codes	✓	✓	✓	✓
Provide technical expertise	✓			✓
Use and interpret non-verbal signals	✓	✓	✓	✓
Create show cue sheets and record back-up of show cues	✓	✓	✓	✓
Operate automation system or console for live shows	✓	✓	✓	✓
Operate rigging equipment	✓	✓	✓	✓
Install, assemble, test, dismantle and pack automation systems				
Operate man lifts and fork lifts	✓	✓	✓	✓
Determine maintenance needs for automation systems				✓
Program advanced cueing on automation systems	✓	✓	✓	✓
Maintain and repair automation systems				
Write technical documents				

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Respondent profile

Rather than relying upon occupational titles to define Automation Technicians, this training gaps analysis uses a broader definition of Automation Technicians. For employees, the definition used in this training gaps analysis is as follows:

- Are you someone who is involved as an installer, operator, troubleshooter or maintenance person with the automation technology on a live music, theatrical, dance, or film production?

For employers, the following definition was used:

- Do you employ people who are involved as installers, operators, troubleshooters or maintenance persons with the automation technology on a live music, theatrical or dance production?

This section is a profile of the respondents who participated in this research study and should not be considered as a 'count' reflecting Automation Technicians.

Respondent profile: Province of origin

Figure 38, below, shows the distribution by province of respondents who participated in the survey. Automation technicians from all ten provinces, plus the Yukon and Northwest Territories, were interviewed. Almost half of the survey respondents (45%) are in Ontario, and another two-fifths are based in British Columbia (19%) or Alberta (18%).

Figure 38   RESPONDENT PROFILE: RESPONDENT DISTRIBUTION BY PROVINCE

Province	%
Ontario	45%
British Columbia	19%
Alberta	18%
Quebec	6%
Saskatchewan / Territories	4%
Manitoba	3%
New Brunswick	2%
Nova Scotia	2%
Prince Edward Island / Newfoundland	2%

Note: Percentages may not total 100% exactly due to rounding.

Respondent profile: Employer / employee status

Respondents indicated whether they were an automation technician employee, or an employer of automation technicians (see Figure 39). Almost two-thirds (65%) of survey respondents identified themselves as an employee, and slightly more than one-third (35%) as an employer.

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Figure 39   RESPONDENT PROFILE: RESPONDENTS BY SECTOR
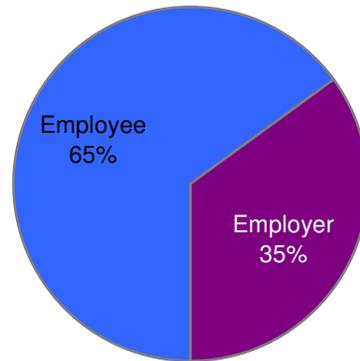
Respondent profile: Production classification

Respondents provided data on the category of production in which they are involved (see Figure 40). Most respondents (87%) are involved in live theatre or musicals. The next-largest cohorts are employed in Rock / Pop or other music concerts (34%), and in dance (25%).

Figure 40   RESPONDENT PROFILE: TYPE OF PRODUCTION

Production	%
Live theatre or musical	87%
Rock / Pop / other music concerts	34%
Dance	25%
Opera	14%
Film / television	14%
Circus	4%
Other	7%

Note: Percentages exceed 100% because multiple responses were accepted. Data derived from Q3.

Respondent profile: Company size

kisquared asked employers to specify how many employees on average, in the past year, have worked in their company. As shown in Figure 41 below, the greatest proportion of employers (34%) have companies employing 26 to 50 workers; another 25% of employers have companies with 11 to 25 employees.

The overall mean number of employees per company is 166.90. The median is 25.

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Figure 41   RESPONDENT PROFILE: NUMBER EMPLOYED PER COMPANY
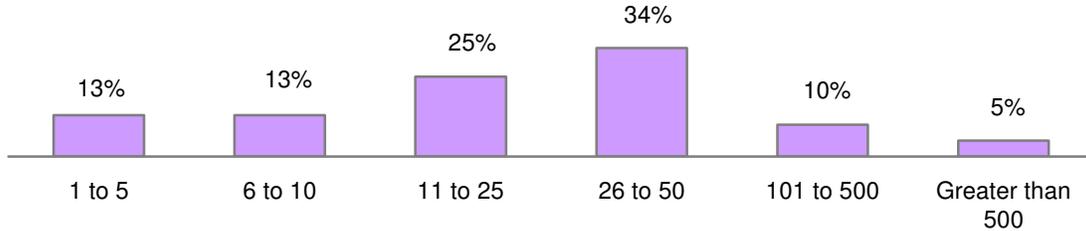
Note: Data derived from Q4.

The same group of respondents was then asked to identify how many of the total number of their employees perform the role of an automation technician – someone who is involved as an installer, operator, troubleshooter or maintenance person with the automation technology on a live music, theatre or dance production. Results are shown in Figure 42.

Most employers (63%) employ only a handful of automation technicians, from 1 to 5, in their company. Of the remaining 37% of employers, 17% have a company employing 6 to 10 automation technicians, 12% employ 11 to 25 automation technicians, and 8% have 26 to 50 such employees in their company.

The overall mean number of automation technicians per company is 8.95. The median is 4.

Figure 42   RESPONDENT PROFILE: NUMBER OF AUTOMATION TECHNICIANS
EMPLOYED PER COMPANY
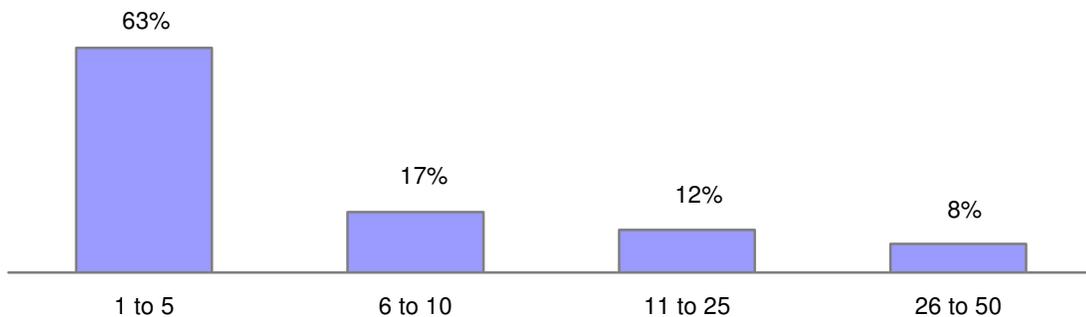
Note: Data derived from Q5.

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Respondent profile: Employment status

Based on previous answers, employers who participated in this survey were then asked about the primary employment basis of their company's automation technicians – permanent full-time, permanent part-time, seasonal returning, contract-by-contract, show-by-show, on-call, on tour, or some other arrangement.

The definition of Automation Technicians adopted in this research study is broader. Specifically, employers were asked about the employment status of those employees who perform the role of an automation technician – someone who is involved as an installer, operator, troubleshooter or maintenance person with the automation technology on a live music, theatre or dance production. Results appear in Figure 43.

Most employers report permanent full-time positions (28%) or contract-by-contract employment (22%) for their automation technician employees. Significant proportions also primarily offer permanent part-time positions (18%) or seasonal positions (16%).

Figure 43   RESPONDENT PROFILE: TERMS OF EMPLOYMENT – AUTOMATION TECHNICIAN EMPLOYERS

Employment	%
Permanent full-time	28%
On a contract-by-contract basis	22%
Permanent part-time	18%
Seasonal returning	16%
Show-by-show	6%
On-call	6%
Other	3%

Note: Percentages may not total 100% exactly due to rounding. Data derived from Q6.

Employees were asked to describe their employment status – permanent full-time, permanent part-time, seasonal returning, on a contract-by-contract basis, show-by-show, on-call, on tour, or some other arrangement.

Most employees, nearly three out of every four, are employed in permanent full-time positions. Of the rest, 15% are employed on a contract-by-contract basis.

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Employment	%
Permanent full-time	72%
Contract-by-contract	15%
Seasonal returning	6%
Permanent part-time	4%
Show-by-show	2%
Other	2%

Note: Percentages may not total 100% exactly due to rounding. Data derived from Q7.

Respondent profile: IATSE membership

Employees

Slightly more than two-thirds of the employees who participated in this survey indicated they were not members of IATSE, versus 32% who indicated they were members of the union (see Figure 45).

Figure 45   *RESPONDENT PROFILE: EMPLOYEES WHO ARE IATSE MEMBERS*
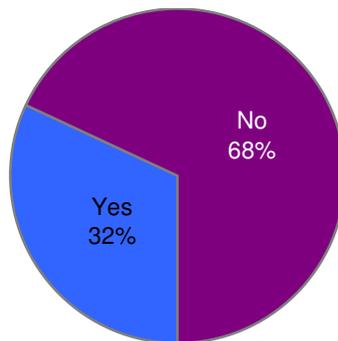
Note: Data derived from Q11.

Employers

Slightly more than half of employers in this survey (54%) indicated they employ workers who belong to IATSE, whereas 46% indicated they do not employ workers who belong to the union.

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Figure 46   RESPONDENT PROFILE: EMPLOYERS WHO EMPLOY IATSE MEMBERS
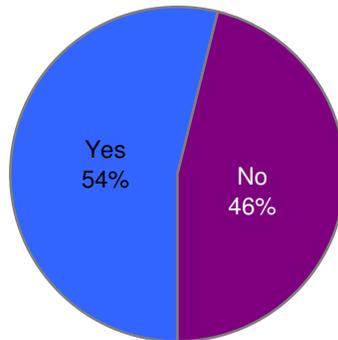
Note: Data derived from Q12.

Respondent profile: Length of active participation in the industry

Respondents were asked how long they have been active participants in the automation technician industry. More than two-thirds of survey respondents (68%) report that they have been actively involved in the industry for over ten years, whereas about one-third (33%) have been in the industry for less than ten years (see Figure 47).

Figure 47   RESPONDENT PROFILE: LENGTH OF ACTIVE PARTICIPATION IN THE AUTOMATION TECHNICIAN INDUSTRY
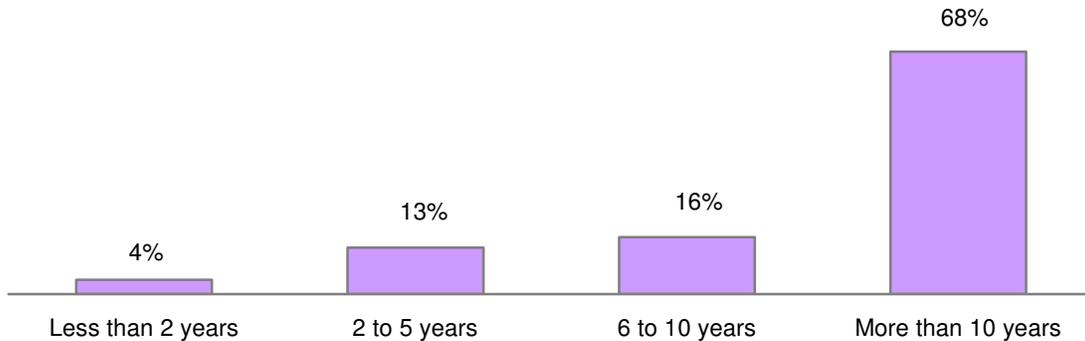
Note: Percentages may not total 100% exactly due to rounding. Data derived from Q14.

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Appendix A: Marginals

SECTOR: Employee .... 65%   Employer........... 35%

PROVINCE: ..BC .. ...19% AB ......18% SK/Terr ....4%   MB .....3%   ON......45%

PQ ......6%   NB ......2%   NS ....2%   PEI/NF 2%

EMPLOYEE NAME: _____ _____

EMPLOYER NAME: _____ COMPANY NAME: _____

PHONE: (__ __ __) __ __ __ - __ __ __ __   EXT: __ __ __ __

May I please speak to _____ _____?

> **ANSWERING MACHINE MESSAGE**: Hello, I'm calling on behalf of CHRC – the Cultural Human Resources Council about the survey. Your name was given to us as an active participant in the automation technician industry. I would really appreciate it if you could return my call at 1-888-950-8002. Also, let me assure you I am conducting research on behalf of the CHRC. This is not a sales call. I look forward to speaking with you soon. And again, the number is 204-989-8002, and the toll free number is 1-888-950-8002. Thanks!

Hello, my name is _____ and I'm calling on behalf of the Cultural Human Resources Council, about a training study for automation technicians. We would like to discuss the automation technician industry with people involved in it, and are looking to speak to someone who can describe their experiences with skill building and training. Would that person be you? **IF NO, ASK WHO WOULD BE APPROPRIATE RESPONDENT AND RECORD CONTACT INFO.**

IF YES… This survey should only take 12 minutes of your time – do you have time right now to complete this survey? **IF NOT, ASK IF THERE IS A BETTER TIME AND ARRANGE TO CALL BACK**

Before we begin I would just like to assure you this information will never be shared with any government agency. All the information gathered through this study is strictly confidential. We guarantee your anonymity. We will be asking questions about your own experiences, but no individual or business names will be attached to the research findings, and the report submitted to the CHRC will only discuss the results of the survey as a whole.

Q1   **[AUTOMATION TECHNICIAN QUALIFICATION]** Are you someone who is involved as an installer, operator, troubleshooter or maintenance person with the automation technology on a live music, theatrical, dance, or film production?

Yes .... 84%   **GO TO Q3**
No... 16%
Don't know / refused .... 0%   **TERMINATE**

Q2   **[EMPLOYER QUALIFICATION]** Do you employ people who are involved as installers, operators, troubleshooters or maintenance persons with the automation technology on a live music, theatrical or dance production?

Yes 100%
No... 0%   **TERMINATE**
Don't know / refused .... 0%   **TERMINATE**

Q3   Can you please tell me what *type* of productions *your company is* [**EMPLOYER**] / *you are* [**EMPLOYEE**] involved with? **CIRCLE ALL THAT APPLY. IF NECESSARY SAY …** For example, live theatre, opera, dance, or film?

Live theatre or musical.................................. 87%
Circus 4%
Dance 25%
Opera.. 14%
Rock / Pop / other music concert 34%
Film / television 14%
Other 7%
Don't know / refused 0%

EMPLOYEES SKIP TO Q7

Q4   In the past year, how many employees, on average, work in your company?

1 to 5 .... 12%
6 to 10 .... 12%
11 to 25 .... 22%
26 to 50 .... 31%
51 to 100 .... 0%
101 to 500 .... 9%
Greater then 500.. 5%
Don't know / refused 9%

Q5   And of all these employees, how many would you say perform the role of an automation technician - that is someone who is involved as an installer, operator, troubleshooter or maintenance person with the automation technology on a live music, theatrical or dance production?

1 to 5	61%
6 to 10	16%
11 to 25	12%
26 to 50	8%
Greater then 500	3%

Q6   Of those automation technicians employed by your company, would you say they are primarily employed on a permanent full-time basis, permanent part-time basis, on a seasonal returning basis, on a contract by contract basis, or some other arrangement?

Permanent full-time	28%
Contract by contract	22%
Permanent part-time	18%
Seasonal returning	16%
Show by show	6%
On call	6%
Other	3%

Q7   [**EMPLOYEE**] Are you employed on a permanent full-time basis, permanent part-time basis, on a seasonal returning basis, on a contract by contract basis, or some other arrangement?

Permanent full-time	72%
Contract by contract	15%
Seasonal returning	6%
Permanent part-time	4%
Other	2%
Show by show	2%

GO TO SKILLS SHEET THEN TO Q8

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[EMPLOYER] Now I want to read you a list of skills that automation technicians in your industry may typically use. For each one, please tell me whether your automation technicians already have this skill, do not have this skill yet, but you believe they may need in the future, or you do not feel your company will ever need.

[EMPLOYEE] Now I want to read you a list of skills that automation technicians in your industry may typically use. For each one, please tell me whether you already have this skill, do not have this skill yet, but believe you may need in the future, or do not feel you will ever need it in your role as an automation technician.

	Have skill, do not have, but need skill, do not have, do not need skill?					Where did you learn this skill / Where do you expect to learn this skill?				FOR ALREADY HAVE ASK …**And where did** *you / they* **receive this formal training?** IF NEED **And where do you expect to get this training from/**
						IF HAVE OR NEED				**IF FORMAL TRAINING**
	Have	**Need**	**Have and need**	**Do not need**	**DK REF**	**On the job**	**Self-taught**	**Formal training**	**DK REF**	
1) The installation, assembly, testing, dismantling and packing of an automation system	71%	11%	2%	15%	1%	85%	24%	28%	1%	Institution_____ Program_____ Duration_____
2) Program advanced cueing on an automation system	60%	18%	2%	17%	3%	86%	16%	24%	1%	Institution_____ Program_____ Duration_____
3) Operate an automation system or console for a live show	80%	5%	2%	13%	1%	90%	16%	21%	1%	Institution_____ Program_____ Duration_____

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	Have skill, do not have, but need skill, do not have, do not need skill?					IF HAVE OR NEED Where did you learn this skill / Where do you expect to learn this skill?				IF FORMAL TRAINING FOR ALREADY HAVE ASK …And where did *you / they* receive this formal training? IF NEED **And where do you expect to get this training from/**
	Have	**Need**	**Have and need**	**Do not need**	**DK REF**	**On the job**	**Self-taught**	**Formal training**	**DK REF**	
4) Determine maintenance needs of automation systems (IF NECESSARY for example, hydraulic, pneumatic, electronic, electrical, mechanical, or computer systems)	64%	11%	2%	23%	1%	87%	13%	14%	3%	**Institution**_____ **Program**_____ **Duration**_____
5) Maintain and repair an automation system (IF NECESSARY for example, hydraulic, pneumatic, electronic, electrical, mechanical, or computer systems)	56%	8%	1%	34%	1%	88%	18%	14%	4%	**Institution**_____ **Program**_____ **Duration**_____
6) Provide technical expertise and advise during rehearsals and shows	89%	1%	2%	8%	1%	91%	11%	11%	0%	**Institution**_____ **Program**_____ **Duration**_____
7) Train substitutes or replacements	74%	2%	1%	22%	1%	95%	8%	8%	1%	**Institution**_____ **Program**_____ **Duration**_____
8) Create show cue sheets and record back-up of show cues	80%	2%	1%	16%	1%	94%	8%	13%	1%	**Institution**_____ **Program**_____ **Duration**_____

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	Have skill, do not have, but need skill, do not have, do not need skill?					IF HAVE OR NEED Where did you learn this skill / Where do you expect to learn this skill?				IF FORMAL TRAINING FOR ALREADY HAVE ASK …And where did *you / they* receive this formal training? IF NEED **And where do you expect to get this training from/**
	Have	**Need**	**Have and need**	**Do not need**	**DK REF**	**On the job**	**Self-taught**	**Formal training**	**DK REF**	
9) General administrative duties like maintenance incidents logs, reports, spare parts lists, and shipping / receiving document	71%	3%	2%	23%	1%	97%	6%	8%	1%	Institution_____ Program_____ Duration_____
10) Write technical documents	49%	4%	1%	46%	1%	89%	9%	16%	1%	Institution_____ Program_____ Duration_____
11) Ensure a safe workplace and compliance with regulations and codes (for example, fire, building, electrical, mechanical, environmental codes and regulations).	90%	4%	2%	4%	2%	88%	7%	17%	1%	Institution_____ Program_____ Duration_____
12) Operate a computer (includes installing software and firmware upgrades)	83%	3%	1%	12%	1%	87%	20%	9%	1%	Institution_____ Program_____ Duration_____
13) Operate conventional hand and/or power tools	96%	1%	0%	4%	0%	86%	20%	15%	1%	Institution_____ Program_____ Duration_____
14) Operate rigging equipment	74%	2%	1%	23%	0%	87%	7%	33%	1%	Institution_____ Program_____ Duration_____

kisquared

	Have skill, do not have, but need skill, do not have, do not need skill?					IF HAVE OR NEED Where did you learn this skill / Where do you expect to learn this skill?				IF FORMAL TRAINING FOR ALREADY HAVE ASK …And where did *you / they* receive this formal training? IF NEED And where do you expect to get this training from/
	Have	Need	Have and need	Do not need	DK REF	On the job	Self-taught	Formal training	DK REF	
15) Operate man lifts and fork lifts	70%	2%	2%	27%	0%	87%	7%	31%	1%	Institution_____ Program_____ Duration_____
16) Communicate ideas effectively in oral or written form	91%	2%	3%	3%	1%	89%	13%	14%	1%	Institution_____ Program_____ Duration_____
17) Use and interpret non-verbal signals	82%	2%	1%	14%	2%	89%	12%	6%	2%	Institution_____ Program_____ Duration_____
18) Practice theatre etiquette in a teamwork atmosphere	95%	1%	1%	4%	0%	95%	5%	11%	0%	Institution_____ Program_____ Duration_____
19) Ability to prioritize, make decisions, and problem solve	94%	2%	2%	2%	1%	94%	12%	8%	0%	Institution_____ Program_____ Duration_____
20) Work at heights	91%	1%	1%	8%	1%	94%	5%	12%	0%	Institution_____ Program_____ Duration_____

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Q8   In the past year, have you attended any conference or workshop related to professional development in the field of automation?

> Yes 30%
> No.. 69%
> Don't know / refused 1%

And what skill or skill set did this professional development pertain to?

> Rigging.. 4%
> Advancement on new technology.................. 1%
> Annual conference 1%
> Automation 1%
> Automation control / installation 1%
> Automation discussion................................... 1%
> Automation technology in general................. 1%
> Automation with stage scenery...................... 1%
> Carpentry and welding................................... 1%
> Covered wide range of things 1%
> Dance management.. 1%
> Dealing with suppliers 1%
> Estimating materials required 1%
> Fire safety.. 1%
> Fixing elevators... 1%
> Heights and lighting....................................... 1%
> LED technology and fire safety 1%
> Lighting.. 1%
> Lighting/sound/rigging 1%
> Lighting and production.................................. 1%
> Lighting conference 1%
> Lighting design 1%
> Lighting programming 1%
> Lighting systems 1%
> Maintenance... 1%
> Manlift operation / rigging.............................. 1%
> Moving/lights/LED technology education
> form.. 1%
> Networking 1%
> New equipment, new trends, safety 1%
> New LED technology 1%
> New machines... 1%
> New material and safety................................. 1%
> New technologies... 1%
> New technology for lighting, LEDs............... 1%
> Overhead rigging 1%

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Pneumatic chain loader 1%
Programming... 1%
Rigging/chain motors.................................... 1%
Rigging/motorized stage scenery 1%
Scenery automation /sound software 1%
Stage automation.. 1%
Stage lighting 1%
Stage safety 1%
Structural Design for Theatre....................... 1%
Suppliers 1%
Technical... 1%
Theatre expo.. 1%
USITT 1%
Various.. 1%
Workshop with CITT................................... 1%

Who offered the training?

Sponsored by CITT or USITT
CITT.. 6%
CITT conference 3%
USITT 3%
USITT conference... 2%
General conference for theatre...................... 1%
Moving (Whole Hog) CITT........................... 1%
USITT and CITT... 1%

Other programs
Don't know 2%
Alberta Federation of Labour........................ 1%
Automation for the stage............................... 1%
Automation technicians conference in
Ottawa.. 1%
Canadian Country Music Awards.................. 1%
Canadian Dance Assembly 1%
Chain master 1%
CHRC meeting... 1%
Christie Lites... 1%
Conference at Lighting Dimension
International 1%
Fire safety.. 1%
IATSE 1%
Introduction to show control......................... 1%
Lighting... 1%
Lighting conference 1%

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Manufacturers seminar.................................... 1%
Niscon (supplier) / Hoffend and Sons
(supplier).. 1%
Open Space Rigging 1%
Rigging in non-traditional places.................. 1%
Rigging seminar 1%
Rendezvous.. 1%
Rigging workshop in London 1%
Safe Stages at Theatre of Alberta.................. 1%
Vari-Lite.. 1%

Q9   We have asked you about a series of automation technician skills. Thinking about
       all the jobs that an automation technician does in their job, are there any skills that
       we have missed speaking to you about? **PROBE**

       _____

       _____

Q10   We have also asked you several questions about where automation technicians
       learn the skills they have – some were learned on the job, some were simply self-
       taught, while others were gained through going to school. Are there any other
       ways that automation technicians can learn the skills they need to do their jobs?
       PROBE

       _____

       _____

Codes ___ ___ ___   ___ ___ ___   ___ ___ ___   ___ ___ ___   Initials _____

Q11   **[EMPLOYEE]** Are you a member of IATSE (**EYE-AT-SEE**)? [**IF
       NECESSARY**: the International Alliance of Theatrical Stage Employees]

                  Yes 32%
                  No.. 68%
                  Don't know / refused 1%

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Q12   **[EMPLOYER]** Does your company employ workers from the IATSE union?

>   Yes 54%
>   No.. 46%
>   Don't know / refused 0%

Q13   What are the first three letters of your postal code?

>   — — —

Q14   How long have you personally been an active participant in the automation technician industry?

>   Less than 2 years.. 4%
>   Two to 5 years.. 13%
>   6 to 10 years.. 16%
>   More than 10 years...................................... 68%

Q15   Since one of the goals of this study is to ensure we speak to a representative sample of automation technicians across Canada, could you please give us the names and contact numbers of any new automation technicians OR companies that may employ automation technicians that you think should be included in this study that we may not have heard about? **CHECK DATABASE AND ENTER ANY CONTACTS NOT ALREADY LISTED.**

Name _____Ph: ___ ___ ___ - ___ ___ ___ - ___ ___ ___ ___
Name _____Ph: ___ ___ ___ - ___ ___ ___ - ___ ___ ___ ___
Name _____Ph: ___ ___ ___ - ___ ___ ___ - ___ ___ ___ ___
Name _____Ph: ___ ___ ___ - ___ ___ ___ - ___ ___ ___ ___

That concludes this survey, thank you very much for taking the time to participate in this study. My supervisor may phone you just to verify that you did participate.

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Appendix B: AT-specific training offerings

Program information

Many universities throughout the country offer theatre programs. Some of these include options for production and design, and may include some technical component (depending on the specific matrix of courses selected by the student). However, the theatre programs at the major universities often focus more on the interpretive and artistic side, and less on the technical side, of theatre production.

For the purposes of this study, we have reported here on technically-oriented programs that focus on developing the competencies required by automation technicians. The summary of program information covers colleges and Cégeps in British Columbia, Alberta, Ontario and Quebec. Our research revealed no technical college program offerings available on the Prairies, in Atlantic Canada, or in the North.

Brief program and content descriptions and website information addresses for 18 such technically-oriented programs are provided below.

British Columbia

Douglas College

At Douglas College, students can obtain a two-year diploma in Performing Arts Stagecraft. The program is intended for students with fine arts or technical experience who are interested in a career within the entertainment industry.

Students completing the program are expected to excel in production techniques, technical direction, stagecraft for film and T.V., audio techniques, stage lighting, computer-aided design (CAD), prop making, scene painting, and scene construction.

http://www.douglas.bc.ca/st/stagecraft/

Langara College

The Department of Theatre Arts at Langara College offers a two-year production diploma program intended to lead to professional careers in theatre, film, television and related arts. The program incorporates lectures and theory but emphasizes the practical application of various skills.

The program is designed for individuals with previous backstage technical theatre experience; thus, it is not a general course in technical theatre.

http://www.langara.bc.ca/programs/THEA.html

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Malaspina University-College

The Theatre Department at Malaspina University-College offers a two-year Technical Theatre diploma, covering stagecraft, graphic techniques, and computers. Those who pursue the Technical Theatre diploma also have the option of transferring their credits to most Canadian universities for completion of a Bachelor of Fine Arts – Theatre.

Students who complete the Technical Theatre diploma often find employment as stage managers, lighting technicians, sound technicians, lighting board operators, technical directors, and theatre managers.

http://www.mala.ca/theatre/index.htm\

University College of the Fraser Valley

Theatre options at the University College of the Fraser Valley include a two-year diploma, a two-year Associate of Arts degree, and a four-year Bachelor of Arts degree. The UCFV also offers weekend workshops, public lectures and external study tours. Courses are geared toward students who want to acquire pre-professional skills to be further developed in career-oriented theatre schools, as well as those pursuing one of the degree or diploma options.

Courses are available to introduce students to technical theatre, including techniques of stage management, lighting, and set construction, as well as sound.

http://www.ucfv.ca/theatre/options.html

Alberta

The Banff Centre

The Theatre, Production, Design, and Stage Management program at the Banff Centre is comprised of a series of technical work-study programs that encourage the development of highly trained technicians. The work-study programs are intended for aspiring professionals with prior training and experience in technical theatre to enhance their production skills through internships, which offer one-on-one contact with professional staff and designers.

http://www.banffcentre.ca/programs/program.aspx?id=500

Grant MacEwan College

Grant MacEwan College offers a two-year diploma in Theatre Production. The program teaches students how to create sets, props, costumes, lighting and sound effects. In addition, areas of the program deal with theory, stage management and other areas of theatre production.

http://www.macewan.ca/web/pvca/production/home/detailspage.cfm?id=888

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Keyano College

Keyano College offers a diploma in Technical Theatre for those interested in finding employment as lighting or sound technicians, set designers, costumers, film editors, scenic artists, theatre directors, make-up artists, or teachers.

http://www.keyano.ca/prospective_students/programs/certificate_diploma/technical_theater.htm

Mount Royal College

Mount Royal College's two-year diploma in Theatre Arts – Technical has been developed for students interested in professional theatre, television and film. The technical program offers a variety of courses in stagecraft, production, lighting, sound, costumes and drafting and design.

http://www.mtroyal.ab.ca/academics/diplomas/TADT.shtml

Red Deer College

Red Deer College offers three streams or majors in the area of Theatre Studies: Acting, Technical Theatre, and Costume Cutting. The Technical Theatre stream is a two-year diploma that focuses on theory, studio training, practical work, sound, lighting, props, stagecraft, drafting and drawing and stage management. Graduates from this program tend to find career opportunities in theatre, television and film.

http://www.rdc.ab.ca/programs_and_courses/certificate_and_diploma_programs/theatre_studies_in_performance_technology_costume_cutting_and_construction.html

Ontario

Cambrian College of Applied Arts and Technology

At Cambrian College, students have the option of obtaining a diploma in Theatre Arts – Technical Production. This is the only two-year technical theatre program in Northern Ontario.

Students study a range of disciplines including lighting, sound production, costume management, stagecraft, set painting, prop making and rendering, special effects and stage management techniques. For the most part, graduates find employment as technicians in the live entertainment industry.

http://www.cambrianc.on.ca/_Our_Programs/Full-time_programs/showpage.cfm?cboPrograms=/fulltime/html/termprograms/200609PATT.HTM

Humber College Institute of Technology & Advanced Learning

Humber's School of Creative and Performing Arts offers a two-year diploma in Theatre Production. The program provides training in the areas of stage management, carpentry, drafting, lighting, properties, rigging, wardrobe, sound and related subjects for students; graduates find employment as production personnel, stage managers and sales/service technicians.

http://postsecondary.humber.ca/04891.htm

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Redeemer University College

Redeemer University College – Theatre Arts offers a variety of courses in all areas of theatre production. Of the technical courses offered, Technical Theatre focuses on the use of tools and materials, working drawings, shop safety, properties construction, lighting, costuming, make-up and stage management. This program also includes a practicum.

http://www.redeemer.on.ca/academics/theatre/

Ryerson Theatre School

Ryerson Theatre School offers a Bachelor of Fine Arts in Technical Production, which, depending on whether the student is interested in management, production or design, covers the areas of technical direction, stage management, theatre administration, prop and costume construction, lighting, sound, technical drawing, set and model building, scenic painting, pattern drafting, sewing, physics, occupational health and safety, welding, make-up, wiggery, pyrotechnics and theatre rigging.

http://www.ryerson.ca/theatreschool/

Sheridan College

Sheridan College offers Theatre Arts - Technical Production, a two-year program featuring educational facilities for technical theatre training, including mainstage and studio theatres, fully equipped scene, props, wardrobe, and carpentry shops, and MIDI and sound labs.

http://theatretechnical.sheridaninstitute.ca/index.cfm?catg_id=0

Quebec

Cégep de Saint Hyacinthe

The Cégep de Saint Hyacinthe offers a four-year technical program in theatre production. During the first and second years of the program, students receive training in the fundamentals of theatre production. In the third year, students can choose to specialize in stage management and technology (*gestion et techniques de scène*).

The stage management and technology stream offers specific training in lighting, sound, soundtracks, and stage management.

http://www.cegepsth.qc.ca/section02/02_1_2_12.html

Collège Lionel-Groulx

The École professionnelle at the Collège Lionel-Groulx offers a four-year program in theatre production that permits specialization in stage management and technology (*gestion et techniques de scène*). During the first and second years of the program, students receive training in the fundamentals of theatre production. Third year students can specialize in stage management and technology (*gestion et techniques de scène*).

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The stage management and technology (*gestion et techniques de scène*) stream offers specific training in lighting, sound, soundtracks, and stage management and stage controls. The program also includes a practical component in which students participate in four theatre productions per year.

http://www.clg.qc.ca/for/index2.html

National Theatre School of Canada

The National Theatre School of Canada offers a three-year program in Technical Production. The program covers core technical competencies including stage electrics, lighting, production management, projections and video, sound, stage management, technical drawing, theatre practice and welding, safety/first aid, carpentry and construction techniques, rigging, and rigging safety.

http://www.ent-nts.qc.ca/nts/techproduction.htm

John Abbott College

John Abbot College offers a three-year program in Professional Theatre (Production) with streams in acting, design, and technical theatre production.

The technical stream provides fundamental skills in all technical and management aspects of production. Students build, set up, and run productions, and participate in sounds, lighting, sets, props, costumes and stage management.

http://www.johnabbott.qc.ca/?5458D7FC-53F4-4D92-9871-F14A664E3060

Professional development information

Canadian Institute for Theatre Technology (CITT)

The CITT functions as a national organization committed to connecting the Canadian live performance community. For over 15 years, the CITT has planned and organized annual conferences that on average bring together more than 100 participants to take part in workshops and information sessions. The conferences focus on new technology in areas such as automation, lighting, sound, rigging, computers, safety, stage design and stage management.

The CITT is also involved at the provincial level, offering customized workshops and providing provincial funding. Its website offers members an online directory, callboard and other resources. Members of the CITT also receive its monthly publication, *Stage Works*, which discusses upcoming events and keeps them up-to-date on current theatre technology.

http://www.citt.org

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United States Institute for Theatre Technology (USITT)

The USITT is the CITT's American counterpart. For the past 45 years, the USITT has worked to organize and develop the theatre industry through planning and hosting conferences and workshops, helping to develop international industry standards, providing fellowships and grants, and offering valuable industry resources.

Every year the USITT hosts a conference and stage expo which brings together between 3000 and 4000 participants nationwide. In 1999 and 2005, its annual conference was hosted in Toronto, Ontario.

http://www.usitt.org

Appendix C: Skills acquisition through formal training

When respondents indicated they received formal training or would expect to receive formal training to learn a certain skill, **kisquared** interviewers then asked where they received such training or would expect to get it. Respondents were asked for the name of the institution, the name of the program and the duration of the program: verbatim responses for each skill are contained below in the following figures.

The installation, assembly, testing, dismantling and packing of an automation system

Institution	Program	Duration
Alberta University	Bachelor of Fine Arts - Technical Theatre	3 years
Banff Centre for the Arts	Theatre	11 months
By Internet or from suppliers / manufacturers	Don't know	Don't know
CEGEP	Production	3 years
College	Technical Theatre	4 years
College	Don't know	Don't know
College	Theatre	Don't know
College	Technical program	Don't know
College	Mechanical & Electrical Engineering	4 years
College / University	Technical Theatre	Don't know
College / University	Automation Technician	4 years
College / University	Any theatre program	Don't know
College / University	Technological	Don't know
College / University	Theatre Technology	Don't know
Dealers / Suppliers workshop	Workshop	2 days
Douglas College	Stagecraft Program	2 years
Douglas College	Stagecraft Program	2 years
Employer apprenticeship	Employer Apprenticeship	Don't know
Employer or College	University	Don't know
Entertainment Services and Technology Association	Automation	Don't know
Grant MacEwan College	Theatre Production	2 years
Humber College	Technical Theatre	3 years
In house	Apprenticeship program	4 hours to a few weeks
International Alliance of Theatrical Stage Employees	Apprenticeship program	Don't know
John Abbott College	Professional Theatre	3 years

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Malaspina University College	Theatre Arts	2 year
Malaspina University College	Technical Theatre	2 years
Malaspina University College	Technical Theatre	2 years
Manufactures' seminar	Lighting / sound	Don't know
Montreal Theatre	Professional Theatre	3 years
Niagara University	Technical Theatre	2 years
Red Deer College	Performing Arts	2 years
Ryerson University	Theatre Technology	4 years
Ryerson University	Technical Theatre	3 years
Ryerson University	Lighting	4 year
Sheridan College	Musical Theatre & Technical Production	2 years
Simon Fraser University	Theatre Program	2 years
Simon Fraser University	Theatre Production	2 years
Supplier	Don't know	Don't know
United States Institute for Theatre Technology	Workshop	2 days
University College of Fraser Valley	Theatre	2 years
University College of Fraser Valley	Bachelor of Arts	4 years
Yale University	Drama	2 years
York University	Theatre Production and Design	4 year Honors

Program advanced cueing on an automation system

Institution	Program	Duration
Alberta University	Bachelor of Fine Arts – Technical Theatre	3 years
British Columbia Institute of Technology	Electronics	2 years
College	Technical Theatre	4 years
College	Don't know	Don't know
College	Theatre	Don't know
College	Technical Theatre	3-4 years
Community College	Automation	Don't know
Company training	Automation	Don't know
Dalhousie University	Technical Theatre	4 years
From lighting / Audio Company	Don't know	Don't know
Grant MacEwan College	Theatre Production	2 years
Guelph University	Theatre Technology	3 years
Humber College	Technical Theatre	3 years
Internal	Internal workshops	2-3 days
John Abbott College	Professional Theatre	3 years
Malaspina University College	Theatre Arts	2 years

Malaspina University College	Technical Theatre	2 years
Malaspina University College	Technical Theatre	2 years
Manufacturers' seminar	Lighting / sound	Don't know
Manufacturer and College	Don't know	Workshop / Degree
Manufacturing training	Workshop	2 days
MIT / Automation	Technician / Engineering Degree	4 years
Niagara University	Technical Theatre	2 years
Private Training Institute	Don't know	6 weeks
Red Deer College	Performing Arts	2 years
Red Deer College	Technical Production	2 years
Red Deer College	Technical Theatre	2 years
Ryerson University	Technical Theatre	3 years
Ryerson University	Technical Theatre Programs	Don't know
Supplier workshop	Don't know	3 days
Suppliers Demonstration	Demonstration	3 hours
United States Institute for Theatre	Professional Development	1 year
United States Institute for Theatre	Conference	Weekend
University College of Fraser Valley	BA	4 years
York University	Theatre Production and Design	4 year Honours
York University	Lighting	2 years
York University	Theatre	4 years

Operate an automation system or console for a live show

Institution	Program	Duration
Alberta University	Bachelor of Fine Arts - Technical Theatre	3 years
British Columbia Institute of Technology	Electronics	2 years
College	Technical Theatre	4 years
College	Don't know	Don't know
College	Theatre	Don't know
College	Technical Theatre	3-4 years
College / University	Any theatre program	Don't know
College / University	Automation Lighting	Don't know
Dalhousie University	Technical Theatre	4 years
Douglas College	Stagecraft Program	2 years
Douglas College	Stagecraft Program	2 years
Ecole Nationale de Theatre	Production	3 years
Grant MacEwan College	Theatre Production	2 years

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Guelph University	Theatre Technology	3 years
Humber College	Technical Theatre	3 years
International Alliance of Theatrical Stage Employees	Apprenticeship program	Don't know
John Abbott College	Professional Theatre	3 years
Malaspina University College	Technical Theatre	2 years
Manufacturers' seminar	Lighting / sound	Don't know
Manufacturers & College	Don't know	Workshop / Degree
Mount Royal College	Theatre Production	2 years
Niagara University	Technical Theatre	2 years
Red Deer College	Performing Arts	2 years
Red Deer College	Technical Production	2 years
Red Deer College	Technical Theatre	2 years
Ryerson University	Technical Theatre	3 years
Ryerson University	Theatre Production	3 years
Sheridan College	Technical Theatre Programs	Don't know
Talkar University (Israel)		
United States Institute for Theatre	Conference	2 days
University College of Fraser Valley	BA	4 years
University of Calgary	Theatre Production	4 years
York University	Theatre Production and Design	4 year Honors
York University	Lighting	2 years
York University	Theatre	4 years

Provide technical expertise and advice during rehearsals and shows

Institution	Program	Duration
British Columbia Institute of Technology	Electronics	2 years
College	College	Don't know
College	Don't know	Don't know
College / University	Technical Theatre Programs	Don't know
College / University	Any theatre program	Don't know
Columbia Academy	Recording Arts	10 months
Douglas College	Stagecraft Program	2 years
Grant MacEwan College	Theatre Production	2 years
Malaspina University College	Drama Program	2 years
Montreal Theatre	Professional Theatre	3 years
Niagara University	Technical Theatre	2 years

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Ryerson University	Technical Production	3 years
Simon Fraser University	Technical Program	4 years
Technical manuals	Don't know	Don't know
United States Institute for Theatre Technology	Rigging / Automation	1 year
United States Institute for Theatre Technology	Show Control conference	2 days
University	University	Don't know
University of Calgary	Theatre Productions	4 years
York University	Theatre Production and Design	4 year Honors

Maintain and repair an automation system

Institution	Program	Duration
Any college	Electronics	Don't know
British Columbia Institute of Technology	Electronics	2 years
College	Don't know	Don't know
College / University	Technical Theatre Program	Don't know
College / University	No	3 years
Companies who supply technical manuals	Don't know	Don't know
Grant MacEwan College	Theatre Production	2 years
Guelph University	Theatre Production	3 years
Manufacturer / supplier / training	Workshop	Don't know
Manufacturers of the system	System training	2 days
Manufacturers' seminar	Workshop	Don't know
Mount Royal College	Theatre	2 years
Red Deer College	Theatre	2-3 years
Red Deer College	Theatre Technology	2 year
Suppliers	Training Session	2 hours
Suppliers	Workshop	Don't know
Workshops	Don't know	2 days

Create show cue sheets and record back-up of show cues

Institution	Program	Duration
British Columbia Institute of Technology	Electronics	2 years
College diploma	Scene and Theatre technique	3 years
College / University	Technical Theatre Program	Don't know
College / University	Any theatre program	Don't know
Douglas College	Stagecraft Program	2 years

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Douglas College	Stagecraft Program	2 years
Grant MacEwan College	Theatre Production	2 years
In house	In house workshops	2-3 days
Malaspina University College	Drama Program	2 years
Red Deer College	Theatre Technology	2 years
Ryerson University	Theatre Technology	4 years
Sheridan College	Musical Theatre & Technical Productions	2 years
Simon Fraser University	Technical Program	4 years
Technical manuals	Don't know	Don't know
Theatre production college	Don't know	Don't know
Theatre school	General theatre program	Don't know
University College of Fraser Valley	BA	4 years
University of Calgary	Theatre Productions	4 years
University of Victoria	Theatre	4 years
York University	Theatre Production and Design	4 year Honours

General administrative duties

Institution	Program	Duration
CEGEP	Audiovisual	3 years
College / University	Technical Theatre Programs	Don't know
College / University	Any theatre program	Don't know
Douglas College	Stagecraft Program	2 years
Douglas College	Stagecraft Program	2 years
Grant MacEwan College	Theatre Production	2 years
In house	In house workshops	2-3 days
Technical manuals	Don't know	Don't know
University of Calgary	Theatre Productions	4 years
Workshops	Don't know	2 days
York University	Theatre Production and Design	4 year Honors

Write technical documents

Institution	Program	Duration
British Columbia Institute of Technology	Electronics	2 years
CEGEP	Audiovisual	3 years
College	Writing skills, technical writing	Don't know
College / University	Any theatre program	Don't know

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Community Colleges / University	Technical Theatre Programs	Don't know
Don't know	Sound Technology	Don't know
Don't know	Don't know	Don't know
Don't know	Don't know	Don't know
Douglas College	Stagecraft Program	2 years
Grant MacEwan	Theatre Production	2 years
In house	In house workshops	2-3 days
Simon Fraser University	Technical Program	4 years
Technical manuals	Don't know	Don't know
Thomas River University	Engineering	1 year
University of Calgary	Theatre Productions	4 years
York University	Theatre Production and Design	4 year Honors

Determine maintenance needs of automation systems

Institution	Program	Duration
Any college	Electronics	Don't know
Banff Centre for the Arts / Red Deer	Theatre Technology at Red Deer	2 years
British Columbia Institute of Technology	Electronics	2 years
CEGEP	Audiovisual	3 years
College	Don't know	4 years
College	Don't know	Don't know
College / University	Don't know	3 years
Community Colleges / University	Technical Theatre Program	Don't know
Douglas College	Stagecraft Program	2 years
Grant MacEwan College	Theatre Production	2 years
Guelph University	Theatre Technology	3 years
Harris College Institute	Technology / Maintenance Engineering	0.5 years
Manufacturers	Training	One day
Manufacturers of the system	System training	2 days
Manufacturing Training	Workshop	2 days
Mount Royal College	Theatre	2 years
Red Deer College	Theatre	2 years
Suppliers	Workshop	3 days
United States Institute for Theatre Technology	Conference	2 days
Workshops	Don't know	2 days

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Train substitutes or replacements

Institution	Program	Duration
College / University	Technical Theatre Programs	Don't know
College / University	Any theatre program	Don't know
Douglas College	Stagecraft Program	2 years
Grant MacEwan College	Theatre Production	2 years
Montreal Theatre	Professional Theatre	3 years
Professional development	Workshops -- leadership	Don't know
Red Deer College	Theatre Technology	Don't know
Simon Fraser University	Technical Program	4 years
Technical manuals	Don't know	Don't know
University College of Fraser Valley	BA	4 years
University of Calgary	Theatre Productions	4 years
York University	Theatre and Production and Design	4 year Honors

Ensure a safe workplace and compliance with regulations and codes

Institution	Program	Duration
Canadian Institute of Theatre Technology	Don't know	4 days
Caroll College (USA)	Theatre	4 years
CEGEP	Don't know	Don't know
City of Whitehorse	Seminar	2 days
College	Training programs	Don't know
College / University	Any theatre program	Don't know
Conestoga College	Ministry and Labour Course	10 weeks
don't know	Workshop	1 day
Don't know	don't know	Don't know
Douglas College	Stagecraft Program	2 years
Douglas College	Stagecraft Program	2 years
Employment training	Safety course	1 week
Fanshawe College	Safety and Safe Work Practices	15 weeks
Grant MacEwan	Theatre Production	2 years
Humber College	Art Administration Program	2.5 years
In house	In house workshops	2-3 days
Malaspina University College	Drama Program	2 years
Online	Whims	4 hours
Red Deer College	Theatre Technology	2 years

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Red Deer College	Performing Arts	2 years
Red Deer College	Technical Production	2 years
Technical manuals	don't know	Don't know
University College of Fraser Valley	Bachelor of Arts	4 years
University College of Fraser Valley	Theatre and Safety	2 years
University of Calgary	Theatre Production	4 years
University of Manchester	Scenic construction	4 years
University of Victoria	Theatre	4 years
WCB / Shape program (BC)	don't know	Don't know
Workplace	Hazardous Materials Handling Certificate	1 day
York University	Theatre and Production Design	4 year Honors
York University	Theatre Production	4 years
York University	Health and Safety Training	2 days

Operate a computer including software installation and firmware upgrades

Institution	Program	Duration
British Columbia Institute of Technology	Electronics	2 years
CEGEP	Audiovisual	3 years
CEGEP / University	Theatre / Automation	Don't know
College / Seminars	Courses / Seminars	Don't know
Columbia Academy	Recording Arts	10 months
Don't know	Don't know	Don't know
Douglas College	Stagecraft Program	2 years
Grant MacEwan College	Theatre Production	2 years
High School	High School	High School course
High School / College	High School / College courses	Don't know
In house	In house workshops	2-3 days
Technical manuals	don't know	Don't know
University College of Fraser Valley	Bachelor of Arts	4 years
University of Victoria	Theatre	4 years
York University	Theatre Production and Design	4 year Honors

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Ability to prioritize, make decisions, and problem solve

Institution	Program	Duration
Any college theatre program	Any college theatre program	Don't know
British Columbia Institute of Technology	Electronics	2 years
College	Don't know	Don't know
College	Scene and Theatre Technique	3 years
Columbia Academy	Recording Arts	10 months
Community Colleges / University	Technical Theatre Programs	Don't know
Douglas College	Stagecraft Program	2 years
Ryerson University	Theatre Technology	4 years
Schulich School of Business (YorkU)		
Technical manuals	Don't know	Don't know
University College of Fraser Valley	BA	4 years
University of Calgary	Theatre Productions	4 years
University of Victoria	Theatre	4 years
York University	Theatre Production and Design	4 year Honors

Operate conventional hand and / or power tools

Institution	Program	Duration
Any college	Technical Theatre	Don't know
Any college theatre program	Any college theatre program	Don't know
British Columbia Institute of Technology	Electronics	2 years
CEGEP	Audiovisual	3 years
College	Scene and Theatre Techniques	3 years
College / School in general	Don't know	Don't know
College / University	Any theatre program	Don't know
Colleges	Don't know	2 weeks
Conestoga College	Manufacturing and Technology	3 years
Douglas College	Stagecraft Program	2 years
High School	High School	3 years
High School	High School	3 years
Montreal Theatre	Professional Training	3 years
Red Deer College	Performing Arts	2 years
Ryerson University	Theatre Technology	4 years
Ryerson University	Technical Production	4 years
Technical College	Don't know	Don't know
Technical manuals	Don't know	Don't know

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United States Institute for Theatre Technology	Carpentry and Welding	1 year
University College of Fraser Valley	BA	4 years
University of Calgary	Theatre Productions	4 years
University of Saskatchewan	Drama	4 years
University of Victoria	Theatre	4 years
University of Waterloo	Theatre Drama	Don't know
Workshops	Don't know	2 days
York University	Theatre Production and Design	4 year Honors
York University	Theatre Production	4 years

Operate rigging equipment

Institution	Program	Duration
Any college	Technical Theatre	Don't know
Any college theatre program	Any college theatre program	Don't know
Banff Centre for the Arts	Don't know	1 day
Banff Centre for the Arts	Rigging	1 year
British Columbia Institute of Technology	Electronics	2 years
Business	Rigging	2 days
Canadian Institute of Theatre Technology	Rigging workshop	4 days
Canadian Institute of Theatre Technology	Industrial Riggers	5 days
Canadian Institute of Theatre Technology	Rigging Workshop	2-3 days
College	Industrial Riggers	Don't know
College / University	Any theatre program	Don't know
College / Seminars	Courses / seminars	Don't know
Colleges	Don't know	2 weeks
Don't know	Don't know	Don't know
Douglas College	Stagecraft Program	2 years
Douglas College	Stagecraft Program	2 years
Douglas College	Stagecraft Program	2 years
Humber College	Technical Productions	2 years
Humber College	Technical Theatre	3 years
International Alliance of Theatrical Stage Employees	Rigging	2 hours
International Alliance of Theatrical Stage Employees	Rigging	2 days
International Alliance of Theatrical Stage Employees	Rigging	2 days
International Alliance of Theatrical Stage Employees	Rigging	2 days
Malaspina University College	Drama Program	2 years
Malaspina University College	Technical Theatre	2 years
Manufacturer	Rigging	2 days

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Manufacturer / supplier	Workshop	1 day
NFCA Trade Shows	Rigging courses	2 days
Red Deer College	Performing Arts	2 years
Red Deer College	Technical Production	2 years
Rig It	Rigging seminar	7 days
Ryerson University	Theatre Technology	4 years
Ryerson University	Technical production	4 years
Ryerson University	Technical Theatre	3 years
Ryerson University	Lighting	4 years
Shaw festival	Workshop	2 days
Sheridan College	Technical Theatre	2 years
Technical Colleges	Don't know	Don't know
Technical manuals	Don't know	Don't know
Tempest Rigging	Workshop	1 week
Tomcat	Workshop	2 days
Trade Union	Workshop	don't know
United States Institute for Theatre Technology	Rigging	1 year
University College of Fraser Valley	Bachelor of Arts	4 years
University of Regina	Technical Theatre	4 years
University of Saskatchewan	Drama	4 years
University of Victoria	Theatre	4 years
York University	Theatre Production and Design	4 year Honors
York University	Theatre Production	4 years
Yukon College	Rigging for carpenters	20 hours

Work at heights

Institution	Program	Duration
Any college theatre program	Any college theatre program	Don't know
Canadian Institute for Theatre Technology	Working at Heights	4 days
College / Vocational Training	Don't know	Don't know
College / School in general	Don't know	Don't know
Canadian Standards Association	Don't know	Don't know
Douglas College	Stagecraft Program	2 years
EASE	Fall Arrest	2 day
Fanshawe College	Safety Practices	3 months
Government	Fall Arrest	Don't know
In house workshop	In house workshop	Don't know
International Alliance of Theatrical Stage Employees	Fall safety	Don't know

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International Alliance of Theatrical Stage Employees	Fall arrest	Don't know
Montreal Theatre	Professional Theatre	3 years
Mount Royal College	Theatre Productions	2 years
Private training companies	Don't know	Don't know
Ryerson University	Theatre Technology	4 years
University College of Fraser Valley	BA	4 years
University of Calgary	Theatre Productions	4 years
University of Victoria	Theatre	4 years
York University	Theatre Production and Design	4 year Honors
York University	Theatre Production	4 years

Operate man lifts and fork lifts

Institution	Program	Duration
Any college	Technical Theatre	Don't know
British Columbia Institute of Technology	Electronics	2 years
Business	Forklift operator	2 days
College / seminar	Courses / seminars	Don't know
Don't know	Workshop	2 days
Don't know	Don't know	Don't know
Douglas College	Stagecraft Program	2 years
Douglas College	Stagecraft Program	2 years
Employer Workshops	Workshops	Don't know
Fork lift supplier	Forklift operator	Don't know
Government	Don't know	Don't know
Government of Ontario	Don't know	Don't know
Hired specialist	Don't know	Don't know
Hunter Industries	Certification Program	2 days
International Alliance of Theatrical Stage Employees	Manlift / Forklift	A day or a couple of hours
International Alliance of Theatrical Stage Employees	Forklift Operator	2 days
International Alliance of Theatrical Stage Employees	Workshop	1 day
Malaspina University College	Technical Theatre	2 years
Manufacturer	Workshop	8 hours
Manufacturer	Workshop	1 hour
Manufacturer	Manlift	2 days
Manufacturer / Supplier	Man/Fork lifts	7 days
Manufacturer / Supplier	Workshop	2 days
Manufacturers Workshop	Workshop	1 day
Red Deer College	Technical Production	2 years

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Red Deer College	Theatre Technology	2 years
Rental Companies	Man lifts	3 hours
Ryerson University	Theatre Technology	4 years
Ryerson University	Technical Theatre	3 years
Ryerson University	Technical Theatre	4 years
Shape	Workshop	2 days
Sheridan College	Technical Theatre	2 years
Sky Reach	Workshop / Man lift	1 day
Specialized courses	Don't know	Don't know
Supplier produced	Workshop	1 / 2 day
Suppliers	Workshop	2 days
Technical Colleges	Don't know	Don't know
Technical manuals	Don't know	Don't know
The shop we rent equipment from	Workshop	1 day
United Lifts (lift supplier)	Supplier training	Don't know
University of Saskatchewan	Drama	4 years
Workshop	Fall Rescue	2 days
York University	Theatre Production and Design	4 year Honors

Communicate ideas effectively in oral or written form

Institution	Program	Duration
Any college theatre program	Any college theatre program	Don't know
British Columbia Institute of Technology	Electronics	2 years
Caroll College (USA).	Theatre	4 years
CEGEP / University	Don't know	Don't know
College	Don't know	Don't know
College / CEGEP	Communication	Don't know
College / University	Technical Theatre Programs	Don't know
Columbia Academy	Recording Arts	10 months
Community College	Radio Systems	2 years
Douglas College	Stagecraft Program	2 years
Internal Workshops	Internal Workshops	2-3 days
Malaspina University College	Drama Program	2 years
Ryerson University	Theatre Technology	4 years
Ryerson University	Theatre	3 years
Ryerson University	Technical Theatre	4 years
Shape	Workshop	2 days
Simon Fraser University	Technical Program	4 years

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Technical manuals	Don't know	Don't know
University College of Fraser Valley	Bachelor of Arts	4 years
University of Calgary	Theatre Productions	4 years
University of Calgary	Drama	4 years
University of Victoria	Theatre	4 years
Yale University	Drama	2 years
York University	Theatre Production and Design	4 year Honors
York University	Theatre Production	4 years

Use and interpret non-verbal signals

Institution	Program	Duration
Banff Centre for the Arts	Don't know	1 day
British Columbia Institute of Technology	Electronics	2 years
College / University	Technical Theatre Programs	Don't know
Douglas College	Stagecraft Program	2 years
Douglas College	Stagecraft Program	2 years
Schulich School of Business (YorkU)		
Technical manuals	Don't know	Don't know
University College of Fraser Valley	BA	4 years
York University	Theatre Production and Design	4 year Honors
York University	Theatre Production	4 yrs

Practice theatre etiquette in a teamwork atmosphere

Institution	Program	Duration
Any college theatre program	Any college theatre program	Don't know
College	Theatre production	Don't know
College	Don't know	Don't know
College / School in general	Don't know	Don't know
Don't know	Don't know	Don't know
Douglas College	Stagecraft Program	2 years
Fanshawe College	Practical Production	15 weeks
Montreal Theatre	Professional Theatre	3 year
Mount Royal College	Theatre Etiquette	1 day
Ryerson University	Theatre School	
Ryerson University	Theatre Technology	4 years
Ryerson University	theatre Production	3 years

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Technical manuals	Don't know	Don't know
Theatre school	Don't know	Don't know
University College of Fraser Valley	BA	4 years
University of Calgary	Theatre Productions	4 years
University of Victoria	Theatre	4 years
Yale University	Drama	2 years
York University	Theatre Production and Design	4 year Honors
York University	Theatre Production	4 years

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Appendix D: Verbatim: missing skills, other training

Figure 48 **Q9. THINKING ABOUT ALL THE THINGS THAT AN AUTOMATION TECHNICIAN DOES IN THEIR JOB, ARE THERE ANY SKILLS OR SKILLS TRAINING WE HAVE MISSED SPEAKING TO YOU ABOUT, OR THAT YOU THINK MAY BE REQUIRED IN THE FUTURE?**

Safety / First Aid is an important skill

I think that safety in the workplace is an important aspect of the industry.

I think safety aspects of the job are important to know.

I think that First Aid is important for automation technicians.

I think electrical safety is an important skill to learn.

I think knowledge of safe working practices is also important.

I think knowledge of safety issues is important to know.

I think that knowledge of safety issues is important to know.

I think that safety is critical to the wellbeing and longevity of people in the industry.

I think that safety is important.

Safety is also very important in this industry.

Safety is a very important skill to have in this industry.

Knowledge of safety, specifically related to automation system and production of the show, is a good skill to have in this industry.

Welding / electrical skills are important

I think that welding is an important skill.

I think that welding skills are important.

I think electrical skills are important.

I think that knowledge of electrical motors is important for automation technicians.

I think welding and metalworking is important.

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Math / Computer skills are important

I think that math skills are important.

I think that more advanced programming knowledge is an important skill.

I think that digital projection is also important to know.

I think that knowledge of programmable logic controls is also important.

I think that being able to troubleshoot and run a crew are both important skills to have.

I think the need to stay current with new technology will be important.

I think that knowledge of wireless technology is important.

DMX technology, wireless dimming and LED technology are all skills that technicians should learn.

Computer networking is an important skill for technicians to have.

Data transference is an important skill to have in this industry.

Being able to program moving lights is a good skill to have in this industry.

Integrating video with lighting is an important skill to have in this industry.

Computer programming and computer animation are good skills to have in this industry.

Integration skills.

Creativity and design are important

I think that creative problem solving is necessary for automation technicians.

I think knowledge of structural design is also an important skill to have.

I think set design and planning are also important skills to have.

I think colour theory is important to know.

I think being able to make more artistic decisions is important.

There needs to be more focus on effects on stage and not just on operating machinery.

Creativity is very important for technicians in this industry.

Design sensitivity and creativity are both important skills to have in this industry.

Artistic creativity is a good skill to have in this industry.

Knowledge of legal rights are important

I think knowledge of legal rights is also important.

Linguistic skills are important

Bilingualism is a good skill to have because it is required everywhere in the industry.

Figure 49   Q10. ARE THERE ANY OTHER WAYS THAT AUTOMATION TECHNICIANS CAN LEARN THE SKILLS THEY NEED TO DO THEIR JOBS?

No, can't think of any other ways

No. (75 responses)

I don't think so. (2 responses)

Not that I know of. (2 responses)

I can't think of any other ways.

I can't think of any.

I can't think of anything at this time.

I don't know of any other way.

I don't think there is any other way to get those skills.

I'm not aware of any other ways.

No – it's a very hands-on activity so much is learned on the job.

Not at all.

Nothing.

Mentoring programs

Mentoring is a good way for technicians to learn new skills. (4 responses)

I think mentoring is a good way to learn. (2 responses)

Mentors are a good way for technicians to learn new skills. (2 responses)

I think apprenticing is an effective learning tool.

Most theatres, manufacturers and distributors have unofficial apprenticeships that are effective learning tools. However, I would like to see these apprenticeships officially recognized with a certificate.

I think that an apprenticeship program through CITT or USITT would be an effective way to develop automation skills.

I think that volunteering is a good way to learn automation skills.

I think that apprenticing is also a good way to learn.

I think that mentoring is also an effective learning method.

Apprenticeship is another way they can learn automation skills.

I think that a mentorship program would also be an effective way to learn new skills.

I think a mentorship program would also be an effective way to learn new skills.

Official apprenticeships would be another way to do it.

An apprenticeship program would be a good way for technicians to learn new skills.

Mentoring would be a good way for technicians to learn new skills.

Apprenticeships would be a good way for technicians to learn new skills.

Co-op programs, mentors and apprenticeship are all good ways for technicians to learn new skills.

Apprenticeship programs are a good way for technicians to learn new skills.

Workshops / seminars

Conferences are a good place for technicians to learn new skills. (6 responses)

Workshops are a good place for technicians to learn new skills. (2 responses)

Attending CITT conferences is another way technicians can learn the skills they need.

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Workshops / seminars (continued)

CITT conferences are also a good way to learn new skills.

CITT conferences are another way for technicians to learn their skills.

CITT is another way they can learn automation skills.

Conferences and workshops are a good place for technicians to learn new skills.

I think seminars and 2-day training courses are important ways to develop skills.

I think that conferencing with CITT or USITT would be an important for skill development.

I think that technicians can also learn from co-workers and seminars.

I think workshops are a good way to learn automation skills.

I think workshops are a good way to learn automation technician skills.

Industry programs and conferences are a good place for technicians to learn new skills.

Industry seminars are a good place for technicians to learn new skills.

Professional institutions and seminars are also good ways technicians can learn new skills.

Sometimes CITT will hire a lighting or sound company to have someone come in and do a 2-day workshop.

Sometimes theatres or manufacturers have workshops on the automation of lighting and staging.

There are associations like Plaza and USITT who can offer training.

They can go to workshops.

Trade seminars through suppliers or manufacturers or through CITT or USITT are good places for technicians to learn new skills.

Unpaid internships would be another way for technicians to learn the skills they need.

Workshops and seminars are good places for technicians to learn the skills they need.

Workshops are a good way for technicians to learn new skills.

Workshops are another place technicians can learn new skills.

Workshops by the manufacturer are a good place for technicians to learn new skills.

Workshops, conventions, CITT, USITT or ESTA are all ways that technicians can learn new skills.

Corporate training

Manufacturers training sessions are a good place for technicians to learn new skills. (5 responses)

Get training from the equipment sales person.

Manufacturers can teach technicians how to use their equipment.

Rental companies provide hands on training and experience for technicians.

I think that the workshops sponsored by manufacturers and suppliers are good ways to learn automation technician skills.

I think that learning directly from automation manufacturers are a good way to learn.

Maybe private companies could teach technicians for short-term training.

I think technicians can learn a lot from manufacturers and CITT.

Suppliers will train someone when something new comes in.

Corporate training, which comes from the supplier or distributor, is a good way to learn.

I think it's important to learn from rental companies for equipment certification.

I think the workshops from distributors are a good way to learn automation skills.

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Corporate training (continued)

I think learning from the manufacturers is another way to learn.

I think the workshops provided by wholesaler and instrument manufacturer are also important ways to learn.

Technicians can also learn from distributor conferences where they buy you lunch and demonstrate new products and how to use them.

Manufacturers or trade union workshops are good ways for technicians to learn new skills.

Manufacturers training sessions and USITT or CITT conferences are good places for technicians to learn new skills.

A manufacturer's demonstration is a good way for technicians to learn new skills.

Learning through manufacturers

Informal or self-teaching

Co-workers are a good way technicians can learn new skills. (2 responses)

I think brainstorming and self-teaching as needed is an effective learning tool.

I think learning from peers and co-workers is effective.

I think that technicians can teach themselves using the internet.

I think that magazines are helpful.

I think that most skills are learned on the job.

I think past experience is important for an automation technician.

I think learning is mostly done on the job.

I think informal training from others in the industry and in the workplace are effective ways to learn.

I think reading manuals is a good way to learn automation skills.

I think the majority of the skills needed are taught on the job.

I think that co-workers can teach most of the skills needed for automation technicians.

Consultation with fellow workers is also a good way to learn.

Learning from senior worker, co-workers or being partnered with an experienced worker would be ideal for technicians to learn new skills.

Trade magazines, sound and video contractors and the CITT website are all good places for technicians to learn new skills.

Formal training

Technicians can learn the skills they need at specialized mechanic courses taught at colleges.

I think that seminars at community colleges are a good way to learn automation skills.

I think that taking specific courses instead of general courses at colleges is an important way to learn the necessary skills.

I think technical institutes are a good way to learn automation technician skills.

I think technical colleges are a good way to learn automation skills.

People can take what they have already learned from college, for example hydraulics or pneumatics, then apply it to theatre technology.

Tech colleges are a good place for technicians to learn new skills.

Asking questions is a good way for technicians to learn the skills they need.

Learning online and colleges are all good ways for technicians to learn the skills they need.

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Don't know

I'm not sure. (3 responses)

I don't know. (3 responses)