A Hidden Gem  
Lee Yasinski, Red Deer College, Canada

“Competency based technical training” thrives amongst Alberta’s high standards in Adult Technical Training of Welders at Red Deer College (RDC) for Alberta Apprenticeship.

ABSTRACT

Competing in today’s oil and gas based economies encompasses more than a country having large available natural resources in oil and gas. Alberta’s competitiveness and leading development in this field stems from a strong proven educational system requiring high standards for technical training of its tradespeople. The delivery of adult technical training in the trades exists using various different delivery models throughout the world. Alberta Apprenticeship sets forth the requirements for a worker to become certified in the trades in Alberta, Canada. Welding Apprenticeship training at Red Deer College, Alberta, Canada exhibits its own unique delivery model “competency based apprenticeship training”. The workings of this competency based apprenticeship training delivery model hosts a blend of both teacher-centered learning and student-centered learning. One of the rewards linked to the student-centred learning is an opportunity to finish technical training early and enter back into the workforce based on proven competency.

Keywords: Apprenticeship Training, Apprentice, Competency Based, Teacher-Centered Learning, Student-Centered Learning

Alberta Apprenticeship:

Apprenticeship in Alberta is a combination of work site experience and technical training in a trade. It is a three way agreement between the apprentice (worker), the employer and Alberta Apprenticeship. Depending on the trade, completion of an apprenticeship program lasts between 1 and 4 years. Apprentices spend approximately 80% of their time learning on-the-job from a qualified tradesperson (journeyperson). The remaining 20% of their time is spent at a college or technical institute learning the theory, technologies and skills behind their trade (technical training). Apprentices earn a pay cheque while working on the job, in an amount relative to the pay rate of journeypeople in the trade. As each year of apprenticeship is completed the apprentice receives a certain percent increase in pay, again based on the pay rate of journeypeople in the trade. Upon completion of an apprenticeship program a candidate receives an Alberta Journeyperson Certificate that meets Alberta’s high industry trade standards. There are approximately 50 designated trades in Alberta. Welding is a compulsory trade in Alberta; a person is required in the trade of welding to be a journeyperson welder or be indentured in the Apprenticeship Program of Welding (welding apprentice). Government commitment: the Alberta Government funds the majority of the cost of apprenticeship technical training (Institute’s requirements for delivery). Student commitment: the student is responsible for paying a minimum registration fee, text costs and Institutional fees. Alberta Apprenticeship has an attendance policy mandating documentation of attendance. APPRENTICESHIP AND INDUSTRY TRAINING (2012-10-01).

Students and Requirements:

Our welding students are adult learners (whose age may range from the late teens to over 50) attending technical training (8 weeks) while trying to balance their everyday life. The students often find it very difficult to maintain their living styles as very few are receiving a wage while attending training. It is not unusual to have up to 40% of a class working outside class hours to support their families or lifestyles. Student entrance requirements set the stage for classes of great diversity in academic ability and work skill sets, coupled with all the other individual student challenges that exist within a class.
The educational requirement to enter into an Apprenticeship Agreement in the trade of a welder is a minimum completion of one of the following: English 10-2 and Math 10-3 both lower level grade 10 courses, GED (General Educational Diploma), or completion of an Alberta Apprenticeship and Industry Training entrance exam for the welding trade (22 questions focused on English, reading and comprehension, 50 questions focused on Math, 28 questions focused on Science) with a pass mark of 70% or higher. The recommended educational requirement would see a student enter the welding trade with an Alberta High School Diploma having completion of English 30-2, Math 30-3, Physics 20 (Chem 20 or Science 20) and Related Career and Technology Studies Courses. APPRENTICESHIP AND INDUSTRY TRAINING (2012-10-10).

Welding apprenticeship students are required to pass both institute and government exams for each year of apprenticeship. Welding apprenticeship students will have to achieve a mark of 65% or greater in their technical training at Red Deer College before they can write the government exam for that year of apprenticeship. The government requirement is a pass mark of 70% or greater. If the student is unsuccessful passing the government exam the student remains at the current apprentice status (1st year, 2nd year or 3rd year) until a pass is achieved.

**Instructor:**

Most college or technical institutes delivering the apprenticeship program require their instructors to have a minimum amount of real life experience (5-10 years) in the trade at journeyperson status, along with further training related to the trade (Engineering Degree) or post-secondary education (college or university level). Competency based delivery requires a well-rounded Instructor proven in skills of: content expertise, techno savvy, presenting and managing of curriculum to adult learners. Student success is based on an instructor's ability to meet the challenges brought forth within the changing dynamics of every class (varied range of academic ability, diverse range of ethnic backgrounds, different learning styles, learning disabilities, real life experience and challenges within the students’ daily life). A welding instructor at Red Deer College needs to have the ability to deliver any component of the curriculum at any time to an individual or group throughout the course. This requires an instructor teaching in the Welding Trade at Red Deer College to be proficient in math, blueprint reading, pattern development, metallurgy, history and codes to list a few alongside several different welding processes. Often at other institutes, where a more traditional training is offered, a content expert would step in to facilitate components like math and metallurgy.

**Competency Based Model:**

Red Deer College Welding Department has been providing its technical training for welders using a competency based delivery model for over 10 years. The current competency based Model used for the Technical Training of Alberta Apprenticeship Welding students at Red Deer College is broken down into two parts (shop component and theory component). The technical training consists of a total of 6 hours/day for 8 weeks; 3 hours/day is assigned to the shop component and 3 hours/day is assigned to the theory component.

Regarding the shop component, Alberta Apprenticeship outlines in its curriculum the amount of time and practical skill level required for students to advance into the next year of welding apprenticeship. Students are expected through the combination of, on the job training and the technical training of the shop component at the institute to meet these criteria for each year. On the job training varies between each and every student in respect to years of field experience and experience with different welding processes (equipment). Students working in the manufacturing industry will develop a different skill set than those working in the petroleum industry or with maintenance. Welding instructors at Red Deer College deliver the shop component of technical training at a ratio of 1 instructor to 12 students. This ratio is very important regarding safety, allowing enough time for multiple demos and sufficient time for individual evaluation and skill advancement. The practical test welds (projects) for each year are evaluated using visual examination or a combination of both visual examination and destructive testing (guided bend test). The evaluation criteria are very detailed and specific regarding the expectation of visual appearance and soundness of weldment (cleanliness throughout its cross-section). Students unable to meet the technical training practical requirements need to repeat the technical training for that year if they choose to continue in the trade. Students often not successful with their first attempt at technical training for any given year are typically successful on the second attempt.
The technical training of the theory component of Welding at Red Deer College is currently delivered in two 1.5 hour blocks per day. One of the blocks is delivered in a classroom; the other block is delivered in a learning commons area. The classroom theory component leans more towards Kember (1997) “teacher-centered/content-oriented conception”. The instructor leads; this time is used to ensure all the curriculum is covered using a variety of different or combined delivery formats (PowerPoints, video, whiteboards, props, you-tube, etc.). Also within this classroom time, student progress and understanding is reinforced and checked (use of clickers, question and answer time, drawing of mind maps, flowcharts, quizzes, etc.). The instructor shares his/her experience and knowledge helping provide a clear direction or path to facilitate the understanding of concepts and information. The instructor role, mimicked as a lead Ant, would be to walk the trailing ants (students) in a single line to a food source (concept) demonstrate how much food (defining details) to break off, how to load it (grasp an understanding) and the path back to the ant hill for storage (retention). This cycle would continue until the entire food source (concept) was broken down into all relevant details allowing a true understanding of a concept.

The other 1.5 hour block of theory time spent in the Learning Commons area draws upon Kember (1997) “student-centered/learning-oriented conceptions”. Students take ownership of learning. The Learning Commons hosts a space offering areas for both group and individual study, internet access and the freedom for students to use college equipment or personal electronic devices (I-pads, cell phones, lab tops, etc.) for their studies. The instructor is provided with a small cubicle (allowing a place for confidentiality when reviewing exams or handling student issues). Students can choose to work in groups or as individuals; the pace to cover a content area is not imposed. This provides flexibility for individual students to move faster through areas of the curriculum that are easier to grasp and slower through areas of less familiarity or more difficulty. Students working together (social networking) utilize personal learning preferences and the sharing of life experiences to help each other achieve an understanding of the concepts. The instructor is close and available for groups and individuals allowing them access to his/her knowledge and experience when needed. The change to student-centered learning delivered in the Learning Commons area revitalizes the students and fuels that all-so-important active learning. This time, the instructor role mimicked as a lead Ant would be to point the trail ants (students) in the direction of the food source (concept), let them work in groups or individuals to break off the food (defining details), figure out how to load it (grasp an understanding through sharing of individual learning experiences and learning styles) and bring it back to the ant hill for storage (retention). The lead ant is there to overlook the activity and help if needed. There is no true set cycle as each group or individual will break down and retain the information by using different techniques specific to their learning needs.

Testing:

Red Deer College Welding Department supports a large test bank for each year of technical training and provides access to online delivery. This allows the flexibility for students to move at different rates based on familiarity or difficulty of subject matter, supports early exit and maintains security and quality of the program. Test questions are randomly picked from pools of questions directly linked to the objectives in the curriculum. A given percent of questions are drawn out of each pool through the use of random selection; assessments created are never identical. We are currently delivering our curriculum using two different assessment manager programs (The Learning Manager 4(TLM4) and Blackboard 9.1(BB 9.1)). Students access their course through the Red Deer College website. A course map (please refer to appendix A) displays content areas and supporting module exams, review exams and supervised exams. Students with access to the internet can finish module exams and review exams at any time throughout the day. Supervised exams are controlled and facilitated online in a test room accessible from the learning commons area at the institute.

Student Recognition:

The delivery system is unique and Red Deer College has become recognized throughout Canada as an institute of choice for technical training in the trade of welding. Word of mouth has students as far as New Brunswick, Newfoundland, Nova Scotia and Prince Edward Island, consistently register to attend technical training here. Students with learning difficulties or who have been unsuccessful at other institutes often find this delivery system provides them the added flexibility allowing for a positive learning experience. As well, students who are highly
self-motivated or supporting families welcome the opportunity of early completion and the reward to enter back into the workforce early.

Conclusion:

“Red Deer College Welding Department competency based technical training model” is the delivery system of envy, it allows adult learners more flexibility in the balancing of studies and lifestyle requirements, the freedom to study through social networking or individual preference, and access to a reward of early completion. All of this is supported within Alberta Apprenticeship’s proven strong educational system with high standards, allowing world class recognition for Alberta’s welding Journeypeople. Lastly and undeniably, it plays an important role in Alberta’s strong economy and ability to stay competitive and on the leading edge of the world’s oil and gas industry.

Author Information:

Lee Yasinski is a professor of welder technical training at Red Deer College. Previously, Mr. Yasinski instructed at Medicine Hat High School in the field of Fabrication Studies. Educational institutes attended: Okanogan University College, Medicine Hat College, Northern Alberta Institute of Technology, Vermillion College.

References

Appendix A: Sample 1st Year Course Map (Red Deer College Welding Department, 2011)