

## Understanding Differences between Welding Education and Training

- Accreditation is not Certification either –

by

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### SUMMARY

This opinion piece attempts to clarify differences between education and training, as well as accreditation vs. certification, as applied to the welding/materials joining field. Instead of being elitist, the author contends that proper understanding of the above concepts could improve the quality of service provided by the welding professionals to society and could contribute to future prevention of catastrophic failures in engineered structures. This paper is aimed at Engineering Managers and other Supervisors who employ Welding Engineers, a position that can be filled by either Educated as well as Trained professionals. The hope is that managers will recognize the strengths and limitations of each category of individuals and make better use of their talents.

### BACKGROUND

To better understand EDUCATION, it is appropriate to look at the word's etymology, as it originated from the Latin "educare" which means to rear, to lead forth, to draw out something potential or latent. Synonyms defined by Miriam Webster Dictionary include: to persuade or condition to feel, believe or act in a desired way. It may or may not include training by formal instruction and supervised practice to develop mentally, morally and aesthetically (Webster's Dictionary).

On the other hand, the root word for TRAINING is the Latin word "traginare", which means to undergo instruction, discipline or drill (Webster's Dictionary). Synonyms include: the act, process or method to impart knowledge or experience acquired or to teach as to make fit, qualified or proficient

The clear implication is that training is more specific than education that begins at home and is a lifelong pursuit to find one's calling. Clearly, training may or may not be part of education (formal or otherwise). To use a culinary comparison, training is similar to using recipes from a cookbook, while education prepares one for writing a cookbook for new ingredients.



Figure 1. Welder/operator training involves observation, practice, testing and results in an acquired skill for a trade. Good eye-hand coordination and steady movements are required in a hazardous environment.

The associated concept of ACCREDITATION can be traced back to the Latin root word “accredere”, which means to give credence to, and comes from the combination of the words ‘ad’ and ‘credere’ (to believe, a set of fundamental beliefs). In other words, accreditation means to give official authorization, to provide with credentials. For educational institutions, this means to maintain standards that qualify graduates for admission to higher institutions of professional practice (Webster’s)

Finally, the word CERTIFICATION comes from the Latin “certus”, or certain, and means to attest authoritatively or to attest as being true or as meeting a standard. Another interpretation is to testify to the truth or genuineness of something – applies to a written statement, carrying signature and seal

The implications of the above differences are significant and need to be discussed candidly to avoid inadequate transfer of knowledge and applications that can result in costly repairs and sometime, catastrophic failures. The purpose of this paper is to clarify the differences between education and training, as applied to the welding/materials joining industry and the role of professional organizations in correctly promoting welding to future generations.

## DISCUSSION

If we put together the above four concepts discussed in the Background section, Accreditation is concerned with an Educational belief system, while Certification simply attests conformance with specific Training outcomes. One example from the US welding industry is ABET accreditation of a BSc degree in Materials Joining Engineering at LeTourneau University (since 1953) versus Certification of American Welding Engineers from the American Welding Society. Another famous program is the Welding Engineering Education is at The Ohio State University (since 1946). The newest Engineering program is about to be launched in 2010 at Liberty University, all well structured creditable programs.

As the Background Section showed, Education is more inclusive (or can include Training), while the opposite is not true. However, the word Education is often misused to describe Training, simply because it sounds and sells better. One such example is the “Education” committee of the AWS that does not include any educators beyond 2-yr Associate Degree College level and certainly deal with

selling Training activities that are Certified (see Certified Welding Inspector CWI Program). While these are commendable programs, they are clearly not Educational in nature and thus they tend to abuse the word Education.

Similarly, several large welding companies “declared” that they offer training under “ESAB University” and other unofficial names that imply that they offer Higher Education level courses. This can be deceiving and unhealthy for the welding industry at large, as trainees typically think they know more about welding fundamentals than they really do. What is especially dangerous is that Training programs do not have to be periodically re-certified as academic programs have to be re-accredited every 4-6 years. Once a Training program is put in place, it can be run indefinitely, in spite of advances in science and technology.

On the Education side, however, the Accreditation Board for Engineering and Technology (ABET), makes sure that each program has a system in place to provide ongoing quality education. The new ABET 2000 criteria are similar to ISO 9000 Quality Improvement Programs, where the main objectives and goals are defined and Engineering graduate outcomes are constantly measured by surveying stakeholders such as students, alumni and employers. After ABET approves this continuous improvement cycle that also includes sub-sections on curriculum, faculty, labs and other facilities, as well as institutional support, they return on a 4-6 years cycle to verify compliance and assess progress.



Figure 2. Welding Engineers (such as Mrs. Anna Biggs, Class of 2009, shown with the author at graduation) have to know design, metallurgy, processes and nondestructive testing. They have to analyze data, validate hypotheses, optimize costs while ensuring safety, communicate effectively and work well in teams.

In conclusion, this opinion piece clarifies some of the differences between Education and Training, as well as Accreditation vs. Certification, especially when misapplied by some in the US Welding industry. Potential dangers of missing the above concepts were emphasized and proper dissemination of this information could eventually avoid catastrophic failures

Disclaimer: This is a collection of personal views and opinions on the subject by the author, based on his individual experiences in 33 years in the business practiced in three countries (Romania, Israel and the USA) and several industries (pressure vessel, aerospace, primary metals, heavy manufacturing, as well as academia). The author teaches at LeTourneau University, Longview, TX.