

Revolutionizing the welding training

New simulation program inspire students

VERDAL: Advanced schools and industrial environments in 37 countries are queuing to adopt a new simulation program for welding training developed by Sør-Trøndelag University College (HiST).

The data tool "iQSim" opens up completely new opportunities to combine theory and practice in vocational training. The company Vitec, which provides training and certification of welders, recently tested a prototype.

Options and variations

For students in secondary school and vocational education and training, weld theory can seem tedious and difficult. It is not easy to see the practical usefulness. This simulation program shows with ease how our choices and variations in welding techniques and procedures have consequences for the outcome, with respect to both quality and costs, says Karl Arne Berg, head of Vitecs welding school.

He stands in front of a digital whiteboard and presses the symbols to select quality of steel, welding method and weld joints with different angles and nose heights. By clicking on the board, the results are presented immediately: the time it takes to weld one meter;

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Karl Arne Berg

how much welding material is added; and last but not least, production costs are accurately computed.

Totally unique

- We can play with different parameters and immediately see the results in relation to selections done; the method that is applied, the amount of current that the welding machine is set to, and how quickly it will be welded. These factors are important for the temperatures that occur and thus the quality the weld. Berg maintains that some selections have great impact, whereas other options have less impact on the weld. It is also possible to see the consequences in terms of the time and financial costs of an incorrect weld, which would have to be repaired and re-welded.

- It's easy to see the connections without resorting to theory and complicated mathematical formulas.

Berg says he has never seen a welding training that is so visual, simple and user friendly.

- This is completely unique. I tested the simulation program on a group of apprentices, and the response was fantastic. They actually began to discuss theory – I've never seen apprentices discuss theoretical issues before, enthuses Berg.

EU project

"iQSim" is funded by the EU Commission Leonardo Program. Sør-Trøndelag University College has had primary responsibility for development in cooperation with research and development partners in Sweden, Lithuania, Hungary and Greece.

Development has been ongoing since 2008.

- The keyword is problem-based learning. Students and pupils can easily access the whole process and obtain a better understanding of why and how the results are achieved. It makes them able to do a better job, says John Birger Stav, Project Manager and associate professor at Faculty of technology at HiST.

New teaching method

He maintains that the simulation program marks the start of a completely new teaching method. 52 high schools that provide welding training will start using the method this fall. "iQSim" is available on the Internet, controlled from a server in Trondheim, and is internationally available. Stav emphasizes that the simulation program is based on interdisciplinarity, and he highlights good and very necessary cooperation with industrial environments, primarily Vitec.

- We have received many suggestions during the program's development, which we have taken into consideration, and more are sure to come. We are already underway to develop a second-generation version with some improvements, says Stav. He believes that there are great opportunities to develop the software in a commercial direction to increase the quality of welding products and reduce costs.

- But at this point in time, our primary focus is on the basic vocational training, says John Birger Stav.

Text below picture:

What happens if ! Training Manager Karl Arne Berg, Vitec and project manager John Birger Stav, HiST, points out that the welding simulation shows the consequences of all choices that are made during the welding process.