Synthetic target systems in control education: lessons teachers are learning from students

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Abstract: In modern Programmable Logic Controllers (PLCs) programming education and training, software packages emulating industrial plants are replacing physical target systems. Whilst this approach is indubitably cost and safety effective, it is important to understand how educationally effective it is, and to what extent can it replace training on real plants. The paper analyses this problem from the feedback that authors got from HMS research and their students in a more than ten years build up experience of control education based on both real and synthetic systems. It concludes that synthetic plants are indeed effective in many training scenarios, but real target systems are still irreplaceable for a cluster of applications. Moreover, despite computer games technology is making synthetic target systems very appealing, both educators and simulation software developers recognize that there is still room for improvement. As such, seizing recent advances in computer technology, software developers are preparing a new generation of synthetic plants.

Keywords*:* control education, programmable logic controllers, synthetic plants, training, education aids, plant control.