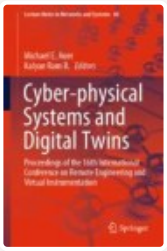

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Developing Virtual Labs in Fluid Mechanics with UG Students' Involvement

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Abstract

Although there are mixed opinion upon the advantages and disadvantages associated with the use of virtual labs, they are still increasingly being adopted by institutions for their curricular teaching. In this study an attempt is made wherein the undergraduate students are made to directly involve in creating virtual lab using the LabVIEW platform. To the authors' knowledge this is one of the first attempts in the country. The virtual labs are created for tracking the profile of the jet trajectory

from an orifice fitted in a tank and for drawing of flownet for a given velocity potential stream function as a part of experiments in fluid mechanics of civil engineering curriculum at undergraduate level. The response of the students indicate that the experience gained by involving in creation of virtual lab gives them a better understanding of the advantages and disadvantages associated and builds confidence in using them.

Keywords

Virtual lab **Jet trajectory** **Flownet**

Fluid mechanics

References

1. Daineko, Y., Dmitriyev, V., Ipalakova, M.: Using virtual laboratories in teaching natural sciences: an example of physics courses in university, pp. 39–47 (2016)

2. Ayas, M.S., Altas, I.H.: A virtual laboratory for system simulation and control with undergraduate curriculum, pp. 122–130 (2015)

3. Gao, Z., Liu, S., Ji, M., Liang, L.: Virtual hydraulic experiments in courseware: 2D virtual circuits and 3D virtual equipments, pp. 315–326 (2008)

4. Ribando, R.J., Coyne, K.A., O'Leary, G.W.: Teaching module for laminar and turbulent forced convection on a flat plate, pp. 115–125 (1998)

5. Sivapragasam, C., Deepak, M., Vanitha, S.: Experiments in Fluid Mechanics and Hydraulic Machinery. Lambert Academic Publishing (2016)

6. Streeter, V.L., Whlie, E.B.: Fluid Mechanics. McGraw Hill, New York (1983)

7. Rama, D.D.: Fluid Mechanics and Machinery, 1st edn, reprint. New Age International Publishers, New Delhi (2006)

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