# 8. Competency focused scalable e-learning tools for engineering education in energy related disciplines: Is Indian system ready for transformation

**[1,*] Gurjit Singh, [2] Dr. Anjan Borah**

[1] Assistant Professor (Electrical Engineering) Faculty of Engineering and Technology Assam Down Town University Panikhaiti, Guwahati, Assam.

[2] CCUBGA (Microbiology) ICAR- Indian Agricultural Research Institute, New Delhi – 110012

*rattan4gurjit@gmail.com

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The declination of fossil fuel has put an emergency and sustainable renewable energy of great interest to National (as well as) International communities. Nearly, every fresh Indian engineering graduate can opt for energy related field due to multi- disciplinary in nature. Limited compatible and result oriented resources are being considered as major challenges for engineering and technology graduates. However, an internet accessible remote laboratory would be able to provide full competency even to remote areas and time friendly in nature. So, scalable of e-Learning tools in engineering education with context to energy related disciplines is the need of hour. It is an add on for effective energy education tools.

Availability of education and trained manpower at all levels is very pivotal for successful implementation of any program towards sustainable use of new & renewable sources of energy. Renewable energy education is therefore, of prime importance.

Today's learners need compact, relevant, self-paced, and target oriented content. This need is fulfilled with the online mode of learning; here, students can learn at their own comfort and requirement. This digitization has led to noteworthy change in how the content is accessed. Despite a voluminous literature on firm- level technological capability building in developing countries, there is still limited knowledge about the relative importance of different learning mechanisms as firms deepen their technological capabilities. But Co-evolution of e-Learning provides to achieve an elevated professionalism.

As e-Learning is a paperless way of learning, it supports and uplift the environment to a greater extent. As per a Literature on e- Learning courses, it has been found that distance-based learning programs consumed around 90% less power and generated 85% less amount of CO2 emissions as compared to traditional campus-based educational courses. E-Learning will boost to forestation and cut down deforestation. Thus, e-Learning for engineering education would be eco-friendly and fruitful awareness creation in the newly emerging era of renewable energy.

Competency focused scalable e-learning tools engineering education with focus to energy related disciplines will create

social awareness in students and will calculate environmentally friendly activities like Paperless Education.