



## **IFEES GEDC IUCEE Brent-Felder Effective Teaching and Learning Online Workshop Series**

### **Background**

We all face urgent global needs (e.g., to minimize and reverse climate change and environmental pollution, develop sustainable forms of energy, provide universally affordable health care, housing, and food, etc.), and the need for adequate numbers of engineers with the skills required to meet the global needs. This will require that we educate our students to possess problem solving skills using creative, critical entrepreneurial multidisciplinary, collaborative, and metacognitive thinking. This is not possible with traditional methods of teaching using conventional textbooks and assessment techniques.

We must use student centric techniques to enable them to be self-directed learners and problem solvers. They should be able to tackle a new problem and figure out what they need to learn to solve it, where to get the necessary information, and how to work their way to a solution, all without professors and textbooks. Such techniques include inductive teaching, active and cooperative learning, technology-assisted instruction, experiential and service learning, formative and summative assessment of learning and high-level thinking and problem-solving skills, instructional design, and instructional development.

Several people around the world have been using these approaches. In order to encourage more educators to change to student centric teaching techniques, we need to provide a global forum for sharing best practices and encouraging collaboration. IFEES, GEDC and IUCEE propose to partner in creating a platform for such sharing and collaboration among global educators. The central element of this will be to build a global community of practice through a series of bi-monthly webinars by educators from around the world.

Two of the leading practitioners of student centric teaching techniques are Dr. Rebecca Brent and Dr. Richard Felder. They have been practicing, as well as training others, in the use of such techniques for several decades. Drs. Brent and Felder are coauthors of *Teaching and Learning STEM: A Practical Guide* (JosseyBass, 2016, <https://educationdesignsinc.com/book/>). Separately and together, they have presented over 500 workshops on effective teaching, course design, mentoring and supporting new faculty members, and STEM faculty development, on campuses and at conferences around the world. More about them is given below.

### **Proposed Workshop Series**

It is, therefore, proposed to launch an online workshop series called “Brent-Felder Effective Teaching and Learning Online Workshop Series” with the mission to identify, nurture and promote an international cadre of engineering professors who use student-centered teaching

methods that have been shown to facilitate students' development of certain specified skills. A global call for speakers will be sent out and speakers will be selected by a panel including Brent and Felder. The online webinars will be delivered in an interactive format. Each webinar will be 1.5 hours duration. Presenters should be skilled at student-centered teaching and should model it in their presentations. Participants of this workshop series will be faculty from around the world who aspire to be outstanding teachers, Assignments will be given to participants at the end of each webinar, so that participants can fully absorb and implement the webinar content. Certificates will be given to participants who complete assignments. The Webinar Series will be integrated with mentoring of teaching and learning programs at each participating institution, during the period between the webinars. The Webinar Series will be assessed by surveys of participants and institutions, after each webinar.

Efforts will be made to ensure representation from around the world. This global community of outstanding teachers will become the beacon to guide engineering educators. The webinar series is expected to commence in May 2022. Funds will be generated in order to provide honoraria to speakers, for grading assignments as well as administration of the program. The program will be for a 2-year period followed by re-evaluation.

A global call for participants will be sent out. Participants will be expected to register in teams of three from any given institution. The institutional leadership must commit to strengthening the ecosystem for teaching and learning in their institution by enabling their team of three faculty to play a leadership role in this process. This can be in the form of support for an existing Teaching and Learning Center or the formation of a new Center if one does not exist.

### **About Dr. Brent and Dr. Felder**

Dr. Brent is President of Education Designs, Inc., a consulting firm in Chapel Hill, North Carolina. She has more than 40 years of experience in education and specializes in staff development in engineering and the sciences, teacher preparation, and evaluation of educational programs at both precollege and college levels, and she has authored or co-authored roughly 120 papers on those topics. She holds a Certificate in Evaluation Practice from the Evaluators' Institute at George Washington University. Prior to entering private consulting, she was an Associate Professor of Education at East Carolina University where she won an outstanding teacher award. In 2014, Dr. Brent was named a Fellow of the American Society for Engineering Education.

Dr. Felder joined the N.C. State University faculty in 1969. He is a co-author of the book *Elementary Principles of Chemical Processes*, which has been used as the introductory chemical engineering text by roughly 90% of all chemical engineering departments in the United States and many abroad, and he has authored or co-authored over 300 papers on chemical process engineering and engineering education. He has won numerous awards for his teaching, research, and publications, including the International Federation of Engineering Education Societies Global Award for Excellence in Engineering Education (first recipient) and the American Society for Engineering Education Lifetime Achievement Award in Engineering Education (first recipient).

### **About IUCEE**

The vision of IUCEE (Indo Universal Collaboration for Engineering Education) is to improve the quality and global relevance of engineering education in colleges in India. Emphasis is on

problem-based learning approaches. The goal of IUCEE is to produce engineers who can contribute to sustainable development. The focus is on faculty development, student development and academic leadership development in order to strengthen the ecosystem for fostering the employability, entrepreneurship and leadership skills of engineering graduates. Faculty from over 100 Indian colleges and 200 global faculty members and experts are connected through this ecosystem. IUCEE was formed soon after the highly popular effective teaching workshops by Dr. Rebecca Brent and Dr. Richard Felder at Infosys, Mysore in 2008 and in 2009.

### **About IFEES**

Mission of IFEES (International Federation of Engineering Education Societies) is connecting the world's engineering education societies to leverage our members' collective strengths to improve engineering education worldwide. IFEES is a global network representing more than 85 stakeholders in engineering education from more than 30 countries. Through the collaboration of its member societies, IFEES works to establish effective engineering education processes of high quality around the world to assure a global supply of well-prepared engineering graduates. IFEES was formed by global leaders at a conference in Rio in 2006 with Dr. Claudio Borri as its first President.

### **About GEDC**

Recognizing the global need for a world-wide forum of engineering deans and rectors, a group of over 20 leaders of engineering education institutions and corporate partners first met in Rio de Janeiro, Brazil, on 9 October 2006 and in Istanbul, Turkey, on 30 September 2007..Our Mission of GEDC (Global Engineering Deans Council) is to serve as a global network of engineering deans, and to leverage on the collective strengths, for the advancement of engineering education and research. Our Vision is to enhance the capabilities of engineering deans to transform schools in support of societies in a global economy. GEDC was established in 2006 by the leaders of institutions from all over the world, at a meeting in Paris.

### **Potential Speakers for 2022-23:**

1. **Dr. Cynthia Atman**, ([atman@uw.edu](mailto:atman@uw.edu)). Director, Center for Engineering Learning & Teaching; Professor, Human Centered Design & Engineering, University of Washington: <https://www.hcde.washington.edu/atman>
2. **Dr. Sheri Sheppard**, ([sheppard@stanford.edu](mailto:sheppard@stanford.edu)), Richard W. Weiland Professor in the School of Engineering, Stanford University: <https://engineering.stanford.edu/person/sheri-sheppard>
3. **Dr. Anette Kolmos**, ([ak@plan.aau.dk](mailto:ak@plan.aau.dk)), Professor, Aalborg Centre for Problem Based Learning in Engineering Science and Sustainability: <https://vbn.aau.dk/en/persons/107361>
4. **Dr. Roger Hadgraft**, ([Roger.Hadgraft@uts.edu.au](mailto:Roger.Hadgraft@uts.edu.au)) Director, Educational Innovation And Research; Associate Dean (Teaching & Learning), University of Technology Sydney: <https://profiles.uts.edu.au/Roger.Hadgraft>

5. **Dr. William Oakes** ([oakes@purdue.edu](mailto:oakes@purdue.edu)) 150th Anniversary Professor, Director, EPICS Program; Professor, Engineering Education, Purdue University:  
[https://engineering.purdue.edu/ENE/People/profile?resource\\_id=4194](https://engineering.purdue.edu/ENE/People/profile?resource_id=4194)
6. **Dr. Stephanie Farrell**, ([Farrell@rowan.edu](mailto:Farrell@rowan.edu)), Professor and Founding Department Head; Experiential Engineering Education Department (ExEED):  
[https://engineering.rowan.edu/faculty\\_staff/listing/stephanie-farrell.html](https://engineering.rowan.edu/faculty_staff/listing/stephanie-farrell.html)
7. **Dr. Khairiyah Mohd-Yusof**, ([khairiyah@cheme.utm.my](mailto:khairiyah@cheme.utm.my)), Director of Universiti Teknologi Malaysia Centre for Engineering Education: <https://tree.utm.my/>
8. **Dr. Uriel R. Cukierman**, ([uriel@cukierman.name](mailto:uriel@cukierman.name)) Universidad Tecnologica Nacional, Facultad Regional Buenos Aires:  
<https://utn.academia.edu/UrielCukierman/CurriculumVitae>
9. **Dr. Bill Williams**, ([bwilliamsbw@gmail.com](mailto:bwilliamsbw@gmail.com)), Setubal Polytechnic Institute; CEG-IST, Universidade de Lisboa, Portugal; TU Dublin, Ireland;  
<https://cegist.tecnico.ulisboa.pt/~cegist.daemon/user/876>
10. **Dr. James Trevelyan**, ([james.trevelyan@uwa.edu.au](mailto:james.trevelyan@uwa.edu.au)), Emeritus Professor in the Engineering School at The University of Western Australia, Fellow of Engineers Australia, and CEO of [Close Comfort Pty Ltd](#). <https://jamesptrevelyan.com/>
11. **Dr. Marlene Kanga**, ([marlenekange@bigbond.com](mailto:marlenekange@bigbond.com)), Past President, WFEO, Australia,  
<http://www.wfeo.org/back-story-dr-marlene-kanga-past-president-of-the-world-federation-of-engineering-interview-by-engineering-technology/>.
12. **Dr. Veena Kumar**, ([certification15@gmail.com](mailto:certification15@gmail.com)), University of Maryland Global Campus, Director, IUCEE International Engineering Educator Teacher Certification Program:  
<https://iucee.org/who-we-are/>
13. **Dr. Debbie Blaine**, ([dcbaine@sun.ac.za](mailto:dcbaine@sun.ac.za)) **Stellenbosch University**, SA  
<http://www.sun.ac.za/afrikaans/faculty/eng/mechanical-mechatronic/Pages/Debby-Blaine.aspx>.