

# **Critical Success Factors for Sustainable Online Engineering Education in Bangladesh**

**Ferdous Sarwar**

Department of Industrial and Production Engineering  
Bangladesh University of Engineering and Technology  
Dhaka 1000, Bangladesh  
[ferdoussarwar@ipe.buet.ac.bd](mailto:ferdoussarwar@ipe.buet.ac.bd)

**S.M. Ahmed**

Department of Industrial and Production Engineering  
Jashore University of Science and Technology  
Jashore 7408, Bangladesh  
[tazim\\_ipe@just.edu.bd](mailto:tazim_ipe@just.edu.bd)

## **Abstract**

The largest disruption of education system in the history has been created due to the global pandemic COVID-19. According to WHO, nearly 1.6 billion learners in more than 190 countries are being affected by the lockdown of educational institutes during this COVID-19 pandemic. In Bangladesh, all the educational institutes have remained closed since 17 March, 2020. More than 36 million learners including the engineering students are now facing the discontinuation of their regular academic curriculum and losing the learning opportunities. This interruption in the engineering education will have a significant negative impact on the country's economy since it will interrupt the supply of engineers for the country in the near future. The only alternative way is the online learning system for the continuation of the engineering education during this COVID-19 pandemic. Many educational institutes have tried to start the online education in Bangladesh. However, many of them have failed to establish the effective and sustainable online learning system since this is a very new phenomenon to the academicians of Bangladesh. Therefore, this study aims to explore the critical success factors for delivering the sustainable online education to the engineering students during COVID-19 pandemic. Reviewing the previous literature from various renowned databases, 10 success factors for efficient and sustainable online engineering education were selected initially. A detailed questionnaire was prepared based on these factors and sent to 30 experts through email. These experts were selected using purposive sampling method and all of them have more than 12 years of experiences on the method and practice of teaching. After collecting all the responses from the experts, Pareto analysis has been performed to identify the most significant critical success factors for sustainable online engineering education. The findings show that the selection of appropriate technology, customization of course structure, support from the institution, selection of appropriate evaluation system and support from the students are the most 5 significant critical success factors for sustainable online engineering education in Bangladesh. Although many established technologies are now available for online education, selection of appropriate technology according to the course context is very crucial to make the online education system sustainable. Effective online engineering education largely depends on the course structure and contents. Hence, customization of course structure is required to ensure effective online engineering education. Moreover, support from the institution as well as from the students is required to make the online education system sustainable. It is also required to select the appropriate evaluation system for the students to make the online learning more interactive. The findings of the study can help the academicians and the authorities to formulate effective strategies to establish effective and sustainable online education system in Bangladesh.

## **Keywords**

Sustainable Online Education; Critical Success Factors; Engineering Education; COVID-19; Pareto Analysis.

## **Biographies**

**Ferdous Sarwar** is acting as an associate professor in the Department of Industrial and Production Engineering at Bangladesh University of Engineering and Technology (BUET). His research interests include: Advanced Manufacturing and Materials Engineering, Operations Management, Operations Research and Decision Analysis.

**S. M. Ahmed** is currently acting as a Lecturer in the Department of Industrial and Production Engineering at Jashore University of Science and Technology (JUST). He earned B.S. in Industrial and Production Engineering from Jashore University of Science and Technology. His research interests include: Supply Chain Management, Ergonomics, Optimization, Decision Analysis, Soft Computing and Machine Learning.