Chapter 3
Designing a Training Platform for Higher Education Engineering Instructors in the Digital Era

Fırat Sarsar
https://orcid.org/0000-0002-3611-8137
Ege University, Turkey

Özge Andıç Çakır
Ege University, Turkey

ABSTRACT

Higher education (HE) should focus on solving the following critical educational problems: (1) using technology and (2) fostering education by new creative learning techniques. In this chapter, the authors indirectly talk about using new technologies in education. There are many reasons that make this choice challenging such as believing in the benefits, having enough knowledge, accessing alternative technological sources, etc. To facilitate this, they introduce an online learning platform for engineering instructors in HE. Moreover, according to their experiences in the field of education and engineering, instructors in HE should improve and revise their skills and knowledge. It is important to enhance knowledge on content, technology, and pedagogy; therefore, this training platform itself focuses on improving those skills necessary for instructors in HE for maintaining an effective learning process. This chapter mainly focuses on creating a course for higher education engineering instructors and a TERR model that is proposed by the authors.

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INTRODUCTION

There has been a global shift towards new engineering trends arising from the need for environmentally responsible products, sustainability as a design approach, fast-changing technology that boosts innovation and seeking solutions by interdisciplinary vision. These bring in not only industrial but also societal growth directing the focus on engineers with new skills and competences. To adopt the needs of labour market, today’s engineers need to improve their soft skills, such as communication techniques, ethics, environmental conscience, social media, etc. to confront socio-scientific issues described here. Another challenge is the demand for a qualified workforce for technology and innovation. New ways of (student-centred) learning are characterised by personalisation, engagement, use of digital media, collaboration and bottom-up practices. Thus, the methods based on which the learner is the creator of learning content are emerging and are facilitated by the exponential growth in open education resources available via the internet.

Today’s improvements in technology provide materials, tools and techniques that make life easier and enable us to work more productively. The devices such as smart boards, classroom PCs, projectors and digital information boards have been introduced to daily classroom activities decades ago. Today, nearly every classroom has such infrastructure, nearly every student uses a smart mobile device but still, a low number of classroom activities are centred on interactive/visual education in classes. Information and communication technologies (ICT) enable the learners to interact within a learning environment and improve the quality of learning experience for students. Nevertheless, EU Modernisation agenda for higher education focuses on as Ossiannilsson (2018) mentioned that promoting to put student in the centre of teaching and learning through greater EU support for meaningful teaching, curriculum design and use of ICT effectively.

Looking from the students’ perspective, they are generally excited for using ICT as learning materials because they are familiar with using ICT in their daily life for information searching and communicating. On the contrary, not born into an ICT supported world like their students, higher education instructors have awareness of technology, are highly knowledgeable in their area, and thus, they might not be expected to be resistant to progress and change in the methods of teaching.

It can be emphasized that successful implementation of instructional technologies in higher education is possible by focusing on the teachers’ beliefs, approaches and their expectations. Disciplines and institutional cultures were among the factors influencing the teachers’ attitudes. Analysing the interviews with a group of higher education teachers they observed within a 10 years period, Englund et al (2016) concluded that there is a significant difference between the conceptions of experienced
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