Chapter 7
Microlearning in Physics Teaching:
An Innovative Proposal

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ABSTRACT

It can be broadly considered that academic factors in general, and the quality of teaching in particular, contribute significantly to academic failure, although they are not the only important factors. Moreover, academic factors are, at least theoretically, the most easily alterable through the intervention of university teachers. This chapter proposes incorporating microlearning into physics teaching in order to favour students' understanding of it. Specifically, it presents a series of considerations for the design of effective micro-modules for teaching physics to general education students. The first part of the chapter discusses the concept of microlearning and highlights the advantages of its implementation in the classroom. The second and last part summarises six important considerations when creating an effective micro-module and presents a concrete example developed by teachers at the Escuela Politécnica Superior de la Universidad CEU - San Pablo in Madrid, Spain.

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INTRODUCTION

Microlearning is a teaching and learning strategy characterized by the creation of short educational resources focused on a single topic or concept to focus the content. It is generally carried out in one or several digital supports, although they can be analogical proposals (Salinas & Marin, 2015).

Every teacher has surely wondered, on many occasions, about teaching strategies, which one to choose and why. First of all, it should be clarified that there is no single answer to this question. Factors such as the type of student with whom one is working and his or her motivation, as well as the subject matter being addressed and the context in which it is done, are decisive (Cátedra UNESCO, 2001).

An appropriate pedagogical strategy does not guarantee immediate success, but it can be the basis for focused and long-term learning, as it teaches students how to learn (Alonso, Gallego, & Honey,1999).

Linder (2006) defines this approach as a succession of short interactions of the learner with a given learning topic, divided into very small parts, whose content can be presented in a minimum time of seconds to a maximum of 15-20 minutes. If we analyze this definition in detail, it can be seen that microlearning is closely related to universal learning and mlearning, which makes it an ideal resource for working with teenagers, who generally prefer to learn at their own pace and when they need to (Dewey, 1938). However, it is important to emphasize that it is not just about adding portable and universal functions to learning (Marcelo, 2002). The idea lies in creating microeducational content based on topics of interest and focused on the characteristics of today's adolescent learners. In other words, microlearning is not only about changing the types of tools we need to apply, but also about transforming the design of our educational proposals to meet the specific needs of today's adolescent learners (Giyurgiu, 2017; Hernández & Torres, 2018).

According to Scolari (2018), adolescents often use informal learning strategies to search for and process information. This happens because current technological advances have expanded traditional learning situations by creating new spaces in social networks, websites, and online communities. Thus, fan communities or social networks have become informal learning spaces.

Furthermore, it is worth noting that adolescents learn best when they discover things for themselves and actively participate in learning. In turn, they participate and achieve better results when activities reflect their interests and needs. More importantly, they prefer to access information quickly, directly and efficiently (Honey & Mumford, 1986; Middle School Microlerning, 2002).

For all of the above reasons, it may be beneficial to apply microlearning in physics education. At the same time, this approach offers great flexibility since it adapts to the learning pace of each student and does not require a large investment of time (García Aretio, 2001; Gentry & Helgensen, 1999).

METODOLOGHY AND MATERIALS

Microlearning is a very versatile approach, since it can be used to learn diverse contents. Its application is usually successful in numerous areas and disciplines because its format is structured in short lessons, which are delivered in small dosage capsules (Net-Learning, 2017). 20,23). However, it is not advisable to design micro-modules for language teaching that deal with complex topics or involve the development of more than one objective at a time. By definition, a good micro-module is based on the achievement of a single objective.