

# Chapter 17

## Is Misinformation a Challenge for Science Students in the Digital Era?

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### ABSTRACT

*This chapter will focus on the perception of scientific topics throughout digital dissemination and educational activities. By assessing the evolution on the impact of massive online information dissemination in scientific topics, the chapter aims to address the issue of quality and reliability of scientific information, disseminated towards university students. For this assessment, it will be argued if we must be concerned about a new generation of students being (intentionally or not) misinformed about core insights of their development. This will be done by outlining the major influences of digital and social media in science students' scholastic activities. By adapting scientific models on the spread of misinformation, this chapter argues how students can be subject to gather and to be exposed to unfiltered data, which can potentially be demeaning to their educational development.*

### INTRODUCTION

Never has the concept of massive online learning gained as much momentum as today. The widespread pandemic of SARS-CoV-2, coronavirus outbreak in early 2020, pushed several restrictions to student and academic mobility (Allo (2020)<sup>1</sup>). As this chapter is written, all major universities in the European Union are closed until further instructions from public health services<sup>2</sup>. In the case of Southern European Universities and Schools, all institutions were shut down as a state of country-wide quarantine was established. In the following days, the Offices of Public Education and Higher Institutions, sanctioned schools to prompt contingencies as to shift education to an online base<sup>3</sup>. At the time of the proclamation of quarantine, university students stopped their curricular activities, canceling regular events for the

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remaining six months of the academic period<sup>4</sup>. As such, education and other branches of society were encouraged to materialize their activities online. Although, at a University level, many schools have already adopted many resources and activities over the internet, nothing at this scale was properly implemented or even tested. The logistics of this “quarantine plan” are challenging. To assure online classes for all University students, as well as performing evaluation activities, institutions navigate through uncharted waters. However, several questions must be addressed: can internet-based solutions provide the response we need? Or, most importantly, can an online course mark the same performance as a traditional class?

With this renewed interest in digital solutions for educational purposes, the development of Massive Open Online Courses (MOOCs) was deeply explored. Different from a simple online page or resource, these MOOCs can reach and provide free open online courses to virtually every student in the world (Baturai (2015); Lee (2018)<sup>5</sup>). Multiple online platforms provide distinct courses, taught by certified university teachers on subjects such as exact sciences, social sciences and computer science. The blended resources for these classes consist of traditional video lectures, evaluation quizzes and other curricular assignments. Nevertheless, as they are open sourced materials and could be linked to an educational institution, one cannot assure a specific course for a unique curricular unit across the globe. They can provide resourceful insights on capital themes, in a broad spectrum, as individual students evaluate the way they can incorporate this knowledge in their school activities (Daniel (2015); Yuan (2013)<sup>6</sup>). Hence, one must embrace the value of MOOCs as complementary scientific repositories of credible academic information, to an undergraduate course, especially when students gain consciousness of their independence in obtaining scientific information.

Using the internet as an important source of knowledge is not a novel concept to university students. Several authors claim that there is a significant gap in scientific literature on the impact of new digital learning methods on student formation (Brundell (2016); Ertmer (2012)<sup>7</sup>). The influence of online journals, magazines and other vehicles of science dissemination (such as online videos and forums) on creating knowledge that thrives the learning process of university science students worldwide, is seldom addressed. This issue is even more noticeable, as nowadays there is more public awareness of the new digital forms of learning, embedded in scientific and social platforms, such as social media (Napal (2020); Yacob (2012)<sup>8</sup>).

Therefore, is it possible to establish a connection between online courses, social media and university education in this digital age? Some reports have studied the individual engagement of students and their scientific education awareness, which in turn, linked the methods in which social media can enable creative student thinking (Wagner (2012); Corso (2013)<sup>9</sup>). In this sense, one must ask: where will prospective students search for their school everyday queries? In an extensive online course with roughly 50 minutes, a textbook in their campus University Library, or a simple 5-minute video on YouTube? As selected students claim, they are more drawn to the premise of learning selected topics from a simple tutorial online (Henderson (2015)<sup>10</sup>). Thus, our focus must be broader. How does the validation of social media contribute to science education efforts, in an area where there is little evidence of proficient use of social media in academic scientific teaching?

When confronted to the possibility of assisting an MOOC, science students stated that they would rather obtain information on a specific scientific question from a social media source, then from outputs related to MOOCs (Henderson (2015)<sup>11</sup>). The same study also argued that students who regularly attend social media platforms, consider these tools as valuable information providers. Although they show a “filtration process” to choose in which content to trust, the eventually report that when they find these contents appealing, they retain more permanent information, regarding certain subjects.

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