Chapter 5

Teaching and Assessing Data Literacy for Adolescent Learners

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ABSTRACT

Today, adolescent learners are exposed to deepfakes from online news to social media. They need data literacy—being able to pose questions about data, extract relevant information, and evaluate claims about data—to retrieve factual information and take informed actions. However, not many students in the U.S. are equipped with data literacy to detect deepfakes. This chapter examines existing practices for teaching and assessing data literacy and suggests best practices for supporting adolescent learners in attaining data literacy. This chapter also discusses the future steps needed to implement these best practices in the classroom so that young learners can mitigate the impacts of deepfakes in their lives.

INTRODUCTION

Today’s technology-driven world creates, represents, and stores data, which are information that tends to be numerical, algorithmic, and visual (Fontichiaro & Oehrli, 2016). In this era, how one observes, spends time, retrieves information, and takes actions largely represented, guided, and stored by data. For example, online news programs provide graphs and statistical findings related to sociopolitical issues. Clicking a link to web content creates an algorithm about the frequency and
tendency of user behaviors. Facing the increasing significance and ubiquity of data in our lives, contemporary lives are affected by how organizations and institutions manipulate big data, including numbers, texts, images, times, and places (Gould, 2017). Data widely affect how people retrieve information and act, especially adolescent learners who are exposed to diverse representations of data from online news to social media. Data literacy is an array of abilities to pose questions about data, use tools and representations for data, extract relevant information, and evaluate claims made in various contexts. The fast development and increased demands in information technology from the 2000s have drawn people’s attention to the concept of data literacy and its many variants (Tedre et al., 2020). Some researchers consider it as an area within digital literacies (Hockly, 2020), but data literacy is targeted to understanding formalized numerical, algorithmic, and visual representation of facts or ideas, not overall digital skills navigating online modes. Although data literacy is one of the most essential knowledge, skills, and abilities (KSAs) emphasized across disciplines and sectors in college and career (van ’t Hooft et al., 2012; English & Watson, 2018), few students in the U.S. are ready to navigate their future by developing the ability to comprehend and use data.

Data literacy is essential for all students because it allows them to study real-life problems and develop solutions based on evidence. Students learn how to identify factors and contexts surrounding data and apply data to specific purposes and situations. These abilities can empower students to dissect messages and intentions behind data and their sources before utilizing information. As teens, they encounter streams of data containing information and numbers, which include deepfakes in multimodal forms. Students equipped with data literacy can evaluate the validity and unbiasedness of data and their sources before using information (Philip et al., 2016; Carmi et al., 2020). Even if a student does not work for the data industry in the future, data literacy is an important skill to make sense of what information influences their lives. With data literacy, students are prepared to navigate social worlds as the future generation of our society, applying data literacy to their work and life in the 21st Century (Leu et al., 2013). For citizens in the 21st Century, data literacy is crucial than before to maximize the benefits of information technology and minimize its harm (Ridgway, 2019). Different types of data are currently created and manipulated. Accordingly, deepfakes can be created and disseminated to anyone who uses digital media. Adolescent learners are exposed to social media platforms such as Facebook, YouTube, and TikTok, which mainly employ visual images and videos. Users in these environments are susceptible to deepfakes if they do not have the awareness and tools to recognize them. (Fazio, 2020; Turton & Martin, 2020).

This chapter examines existing practices for teaching and assessing data literacy by reviewing the literature. The author used an array of databases reputable in the field of education and behavioral science such as ERIC and PsycINFO. Journal articles
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