Chapter 28
Development and Validation of an Instrument for Online Learning Fatigue in Higher Education

Ufuk Tugtekin
Mersin University, Turkey

ABSTRACT

The rapid and relatively compulsory integration of learning management systems (LMS) in educational settings has triggered the everchanging needs once again to assess the potential negative outcomes of online learning environments amid the COVID-19 pandemic. This study presents the rationale for developing an instrument for doing such an assessment, and the research demonstrates evidence of reliability and validity qualifications in assessing the fatigue resulting from the excessive online learning experience in higher education. The instrument consists of 28 items and seven factors. The data were collected via learning management systems from a sample of 884 online learning experienced students in higher education. Results of factor analyses revealed that the scale demonstrated no indication of deficiency in reliability or validity when evaluating the fatigue levels resulting from the excessive online learning experience. Consequently, the scale could be used to assess and improve the fatigue levels of individuals who experienced excessive online learning in higher education.

INTRODUCTION

In recent years, technological transformations and the rapid development of technological tools have contributed to the shaping of new media and numerous communication environments (Apaolaza et al., 2013; Koc & Barut, 2016; Zhong et al., 2011). The new media and communication environments preferred in educational settings are expressed as general "Learning Management Systems (LMSs)" at the most basic level (Paulsen, 2002). The rapid integration of different LMS into distance education or online learning environments amid the COVID-19 pandemic has catalyzed the need to evaluate poten-

tial negativities faced by individuals participating in distance education, including the K-12 level. This is because, distance education has become a necessity rather than an option today, amid the pandemic (Bozkurt & Sharma, 2020). Although it has various potential positive aspects such as instantaneous crisis management, providing continuity of education, and being an effective solution that can be applied, it is seen that some negative factors brought about by distance education and Emergency Remote Teaching (ERT) are ignored by researchers. Therefore, it is necessary to examine the multifaceted effects of problematic technology usage behavior, especially in educational settings, considering today's conditions affected by the pandemic.

The term "fatigue" that has come to the fore as a result of excessive technology use, unconscious use of technology, low technology literacy, low new media literacy, and overexposure to technology-supported content, has attracted the attention of researchers in traditional settings (Elhai et al., 2017; Karr-Wisniewski & Lu, 2010; Koc & Barut, 2016; Lee et al., 2016; Tugtekin et al., 2020), but the case has been ignored in the field of distance education. Fatigue is the sensual realization that physical and/or mental activity has been declared less capable owing to imbalances in availability, use and/or restore the resources required for the activities involved (Aaronson et al., 2003). In general, the phenomenon which comprises both physical and psychological components was characterized as fatigue. The level and duration of fatigue could vary amongst individuals, even the same person (Corwin et al., 2002). In addition, individuals participating in LMSs, which are continuously connected communication platform, are expected to be physically and psychologically prepared for the huge information demands arising from distance education and to be ready for self-regulated learning. On the other hand, the increased need for attention can cause a feeling of fatigue that causes physical and psychological strain. In an efficient online learning application, it is important to examine the negative outcomes in addition to the positive factors. The current study provides the rationale for the development and verification of a valid and reliable measurement tool to assess online learning fatigue in higher education. Therefore, it is thought that it is important to examine the level of fatigue and sub-factors of individuals, especially young adults in higher education, who participate in online learning at an intense pace when face-to-face education is not possible amid the COVID-19 pandemic. In this regard, the current study, which evaluates transactional stress and coping theory as an overarching theory; overload is considered as a fundamental factor of fatigue and aims to determine the dimensions of information overload (for a review please see, Barley et al., 2011; Edwards & Cooper, 1990; Lazarus, 1966; Lee et al., 2016).

THEORETICAL FRAMEWORK AND RATIONALE

The transformation in Information and Communication Technologies (ICTs) and computer network-based technologies have caused significant changes in communication, socialization, and education among individuals (Salehan & Negahban, 2013; Tugtekin et al., 2020). Networks preferred in the field of education are based on LMSs (Cavus, 2015). With the transformation of internet-based technologies into an integral part of daily life, individuals have become able to communicate and interact with many more people compared to the people they meet in real life (Boyd & Ellison, 2007; Mahajan, 2009). Thus, the ability to access different information is supported. Numerous advantages provided by internet-based technologies, on the other hand, contain some problematic issues (Dylko et al., 2017; Tugtekin et al., 2020). The most important of these is the availability of excessive information and the tendency towards information overload behavior. Among the factors of this circumstance are factors such as low level of

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