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# Gamification and e-learning for young learners: A systematic literature review, bibliometric analysis, and future research agenda

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ABSTRACT

Over the last few years, gamification has sparked significant interest in both industry and academia. However, the focus of the debate has been mostly on game studies and human-computer interaction (HCI). Even though games are increasingly being supplied as services to customers, few academic works have linked game studies to the service or marketing literature (Dikcius and Urbonavicius, 2020; Dukembay and Zhaksylyk, 2019). This paper presents an examination of the emerging trends of gamification and e-learning for young learners. The first section presents a text-based cluster bibliometric analysis based on 222 qualified articles published between 2015 and 2020. We conducted this analysis to identify the most prominent themes in the literature through cluster identification via the VOS viewer software. As the themes were found to be interlinked, the second section presents a systematic literature review based on a bibliometric analysis performed using the PRISMA method on 32 qualified articles. The findings highlighted the four major future research themes of personalization, game elements, learner styles, and learner engagement. Finally, we provide a future research agenda based on the theory, characteristics, context, and methodology (TCCM) framework. Our findings offer key insights aimed at enabling actors in education policy making and gamification-based software companies and agencies to identify the gamification techniques best suited for e-learning.

## 1. Introduction

Information systems (IS) analysts have extended their possibilities in regard to the utilitarian estimation of IS—e.g., profitability, adequacy, and helpfulness (Behl and Dutta, 2020; Högberg et al., 2019; Poncin et al., 2017; Suh and Wagner, 2017)—to include their hedonic value (C.-L. Hsu and M.-C. Chen, 2018; Poncin et al., 2017). One of the resulting developments is gamification, which has attracted the attention of several researchers. Gamification refers to the utilization of game plan components and of so-called game dynamics to draw in end clients in non-game settings (Hsu and Chen, 2018; Huotari and Hamari, 2017). Gamification has become increasingly popular in promoting student motivation and learning activities (Bovermann, Weidlich, and Bastiaens, 2018). Compared to more conventional game-based modes of knowledge, distribution techniques are more commonly being used to inspire people in regard to meaningful learning (Bassiouni and Hackley, 2016; Batat, 2020; Jayawardena, 2018; Skinner et al., 2018).

The fundamental components of a gamified application, namely that of "game mechanics" are mechanismsused by agents to interact with the game environment (Deterding et al., 2011; Sicart, 2008). From analysis (Järvinen, 2008) through game design, game researchers and designers have presented a number of definitions of game mechanics that have been employed in various situations (Hunicke et al., 2004). The game mechanics of digital points, badges, or leader boards have been most typically connected with current types of gamification (Deterding et al., 2011; Hamari and Koivisto, 2015). Users can acquire digital points, often known as points, which can be used as status indicators, to enable access to certain material, or to spend on virtual products or gifts

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