Virtual reality and gamification in marketing higher education: a review and research agenda

Abstract
Purpose – The purpose of this paper is to review studies on the use of virtual reality (VR) and gamification to engage students in higher education for marketing issues to identify the research topics, the research gaps and to prepare a future research agenda.

Design/methodology/approach – A literature review is performed based on two search terms applied to Web of Science, resulting in a final pool of 115 articles. A text-mining approach is used to conduct a full-text analysis of papers related to VR and gamification in higher education. The authors also compare the salient characteristics presented in the articles.

Findings – From this analysis, five major research topics are found and analysed, namely, teaching methodologies and education, experience and motivation, student engagement, applied theories in VR and gamification. Based on this and following the theory concept characteristics methodology framework, the paper provides directions for future research.

Originality/value – There is no comprehensive review exploring the topics, theories, constructs and methods used in prior studies concerning VR and gamification applied to higher education services based on all the articles published in well-regarded academic journals. This review seeks to provide deeper insights, to help scholars contribute to the development of this research field.

Keywords Virtual reality, Gamification, Education, Learning process, Student engagement, Text-mining

Paper type Literature review
Resumen

Propósito – En este documento se revisan los estudios sobre el uso de la realidad virtual (RV) y la Gamificación para involucrar a los estudiantes en la educación superior en marketing, se identifican los principales temas de investigación tratados, las lagunas de investigación y se sugiere una agenda futura de investigación.

Diseño/metodología/enfoque – Una revisión de la literatura basada en dos búsquedas en Web of Science (WOS) permitió identificar 115 artículos. La minería de textos se utilizó para realizar un análisis de texto completo de los artículos relacionados con RV y gamificación en la educación superior. Los autores también compararon las características más destacadas de los artículos.

Hallazgos – A partir de este análisis, se encuentran y analizan cinco grandes temas de investigación: metodologías de enseñanza y educación, experiencia y motivación, compromiso de los estudiantes, aplicadas a la RV y la gamificación. Basándose en esto y siguiendo el marco del TCCM, el artículo proporciona una agenda futura de investigación.

Originalidad/valor – No hay una revisión exhaustiva que explore los temas, las teorías, construcciones y métodos utilizados en estudios anteriores relativos a RV y gamificación aplicados a servicios de educación superior basados en todos los artículos publicados en revistas académicas. Esta revisión proporciona una panorámica más detallada y sugiere a los académicos nuevas líneas de trabajo para seguir desarrollando este campo de investigación.

Palabras clave – Realidad virtual, Gamificación, Educación, Proceso de aprendizaje, Participación de los estudiantes, Minería de textos

Tipo de artículo – Revisión de la Literatura

1. Introduction

Technology is in continuous development, gaining increased relevance in several areas. Distinct stakeholders are willing to engage with organisations and recent technological advancements allow new ways to do so. In services, and specifically in higher education environments, these cases are even more pronounced as organisations are dealing with stakeholders with specific characteristics, such as students. Students are mainly from younger generations, such as Millennials or Generation Z, who are digital natives (Mulvey et al., 2019). Virtual reality (VR) is a computer-generated simulation of a situation that allows individuals to be immersed and abstracted from the real environment when interacting with the virtual environment in a manner that appears to be real (Flavián et al., 2019a; Loureiro et al., 2019c; Loureiro et al., 2020). VR can make it easier for students to be more focussed and immersed in the simulation of a task that can be learned and repeated (with or without mistakes) until it is performed in a real environment without mistakes (Bower et al., 2017). At the same time, the use of gamification (game-design elements in non-game contexts to improve the user’s engagement) in education seems to emerge as a tool to motivate and captivate students to learn (Looyestyn et al., 2017; Nurul and Mohamad, 2018; Lopez Carrillo et al., 2019). Therefore, it became relevant for organisations to understand this phenomenon in the scope of marketing and services. In the field of education, there is still no study reviewing the current state-of-the-art on VR and gamification that can show the main research pathways already addressed, present the most important topics and studies, as well as future research avenues. This review gains interest at a time when a large number of universities, colleges and other institutions are converting to distance learning due to restrictive crowding measures (coronavirus disease – COVID-19).

The current study conducts a literature review based on research published in periodicals indexed to Web of Science (WOS). Two distinct search terms are applied to this database, returning a final group of 115 papers. To analyse the content of these papers, the current study resorts to a text mining technique called topic modelling to find latent topics on VR and gamification in higher education. Recently, topic modelling has been used to
uncover correlated discussions in text (Loureiro et al., 2019c; Loureiro et al., 2020). The TCCM framework used in prior reviews (Terjesen et al., 2013; Paul and Rosado-Serrano, 2019), in which T stands for theory, C for context, C for characteristics and M for methodology, is followed to present the future research agenda. As in the case of the review by Paul et al. (2017), this study adapts the framework to consider three components, namely, theory, characteristics and methodology. Consequently, the paper:

- provides an overview of the conceptualisation of the core concept of the topic in analysis;
- presents the theories, characteristics and methodologies found in the articles;
- analyses the most important topics and studies emerging from this literature; and
- suggests a future research agenda.

The remainder of this article is structured as follows: In Section 2, we discuss the review methodology, followed by the data analysis, describing the review, content analysis and clustering and the latent topics emerging from the review in Section 3. Section 4 presents directions for future research and in Section 5, the conclusions, limitations and implications are reported.

2. Review methodology

Systematic review papers can be of several types, namely, a structured review focussing on widely used methods, theories and constructs (Canabal and White, 2008; Kahiya, 2018), a framework-based review (Paul and Benito, 2018), a hybrid-narrative with a framework for setting a future research agenda (Bilro and Loureiro, 2020; Paul et al., 2017), a theory-based review (Gilal et al., 2019; Paul and Rosado-Serrano, 2019), a meta-analysis review (Knoll and Matthes, 2017), a bibliometric review (Randhawa et al., 2016) and a review aiming for model/framework development (Paul and Mas, 2019). For this paper, the authors adopt a hybrid review, comprising a structured review followed by a TCCM framework.

Following the six Ws of the literature review method (Callahan, 2014) and the well-established guidelines for a search method for review articles found in previous reviews (Canabal and White, 2008; Tranfield et al., 2003) an extensive search was conducted on WOS. The assessment of research based on the journal in which it is published is a widely adopted practice (Chavarro et al., 2018; Loureiro et al., 2019c). WOS is a renowned electronic database, the content of the WOS collections is selective and consistent and an independent and detailed editorial process ensures journal quality (Clarivate, 2019). The research process was undertaken by a research team comprising all the authors of the present paper, who looked for all publications in scholarly journals published until the end of 2019 in the WOS database. To locate the most relevant studies addressing the purpose of this review, the researchers made two queries using the keywords “VR” and “gamification”. The use of these two keywords is central to the focus of our research. The reason for deciding to use both keywords was based on the prevalence of the terms in the existing literature. For these two sets of queries, the researchers added the keywords of “education” and the relevant marketing topics, such as “marketing” or “services”, which resulted in the search expressions below. The search process was conducted for keywords in the title, abstract and keywords. These keywords were selected based on their relevance to the topic under review. Most of these keywords are followed by a wildcard to account for distinct possibilities from the root word. The final queries for our search are:
Query 1:

TS = (VIRTUAL REALITY* AND EDUCATION* AND (MARKETING OR SERVICE*))

Query 2:

TS = (GAMIFICATION* AND EDUCATION* AND (MARKETING OR SERVICE*))

The first results from using these two queries reveal a total of 281 articles for Query 1 and 150 articles for Query 2. These results show relevant information and indicate there is a lack of research on these topics, which highlights the relevance and appropriateness of this paper. The results achieved from the previous two queries were filtered to return only papers in English in peer-review journals, returning 128 articles for Query 1 and 69 articles for Query 2 (Figure 3). We can recognise the range of scientific areas these articles come from, considering their dispersion among the different journals publishing them. This analysis shows that this set of papers (197 in total) are from a varied set of scientific areas, such as not only marketing and educational environments but also computer science and engineering and medicine and health sciences. We can see the distribution of the most frequent WOS categories in Figure 1 for Query 1 and Figure 2 for Query 2.

As shown in Figure 1, with the distribution for Query 1 using the keyword VR, most of the WOS categories are related to computer science, surgery and educational research. On the other hand, when we analyse the distribution from Query 2 (Figure 2), we conclude that most of the WOS categories are related not only to educational research and computer science but also to business and management. These results show there are differences in the research outputs if we are referring to VR or gamification. VR is more present in research on medicine and health sciences, and other scientific areas, while gamification starts to be more widely used in studies on business and management.

Based on the dispersion analysis mentioned in the previous section, the authors resort to content validation of each paper to guarantee that this literature review focusses on our field of research. This content validation was made independently by each of the authors, and by
two independent experts in these topics following the quality criteria adapted from Pittaway et al. (2004) and Macpherson and Holt (2007) (see Appendix). The output of this content validation results in our final set of 115 articles – 67 from Query 1 and 48 from Query 2 – which are used in this literature review (Figure 3).

3. Data analysis

3.1 Descriptive review

Analysing this final pool of 115 articles, we find that the first article published in the group of articles resulting from Query 1, related to VR, is from 1999 (Figure 4) and that the majority of articles are from the past five years (2015 onwards).

These results are quite different from the results achieved from Query 2, using the concept of gamification. As we can see in Figure 4, the first article to be published in this set of articles is from 2014, and most of the articles are from the past three years. We can see some significant differences between the results from VR and gamification. Articles devoted to VR are more common and have appeared since 1999. In contrast, articles on gamification are much more recent as we only find articles from the past five years (from 2014). These results show both topics as being very recent in the literature, with little research devoted to them, highlighting the need for further studies and the relevance of this paper.

Moving forward with this analysis, we underline another relevant issue, which is associated with the journals where the articles of our final pool were published. Once again, the division between both queries shows differences in the publishing of articles and research development between VR and gamification. Table 1 shows the journals with most published articles from Query 1, devoted to VR. Overall, some journals devoted to human-computer interaction, such as Computers and Education or Computers in Human Behaviour have several articles published. Other journals, specifically devoted to the marketing sphere also appear, such as the Journal of Interactive Marketing and Journal of Consumer Research. Nonetheless, most journals still focus on other scientific areas such as computers and technology or medicine. This pool of papers only includes 27 papers out of a total of 67, meaning that most of the journals have only published one article on this topic.

Analysing the final pool of articles from Query 2 (Table 1), devoted to gamification and the journals with most published articles, we find, once again, some differences as in the previous analysis for Query 1. The journals with most published articles are the Journal of
Interactive Marketing and Computers in Human Behaviour. Others, such as the Journal of Marketing Education and International Journal of Engineering Education, also have more than one article published. However, apart from these examples, every other journal only published one article on this topic. It seems relevant to highlight some journals that have published only one article, understand to what extent some journals devoted to business, management and marketing are already publishing research in these domains.

Analysis of Table 1 reveals that the journals publishing most articles (resulting from Query 2) are no longer from computer sciences or medicine but from the interaction between technology and marketing, marketing and interactive environments and education in marketing. These results show a significant difference from the pool of articles resulting from query 1, as these results are already more devoted to the scientific areas focussed on in

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**Source:** Milgram and Kishino (1994)
Table 2 summarises the theories, characteristics and methodologies used in the articles analysed, following the TCCM framework.

3.2 Content analysis and clustering
Content analysis of the final pool of papers (115) is based on a text-mining technique to find the latest topics in the literature review. This type of technique is widely used to reveal latent topics in scholarly documents (Loureiro et al., 2019c; Loureiro et al., 2020). Helping researchers to implement this technique is text-mining software (MeaningCloud), in which a text clustering technique is performed. This technique allows processing and aggregating a large amount of unstructured text to extract relevant information (Fan et al., 2006), as it can create groups (clusters) by analysing the complete text (Fan et al., 2006; Srivastava and Sahami, 2009). The software tool perceives a text as being in one group of concepts (known as clusters) rather than another, being more similar to each other than to those in other clusters (Spinakis and Chatzimakri, 2005) and then the text-mining system classification for cluster sizes is used to select the suitable number of clusters (Punj and Stewart, 1983). The algorithm receives a set of texts and returns the list of detected clusters. Each cluster is assigned a descriptive name, a size value (indicating its relative importance in relation to all clusters) and the list of elements included in the cluster.

After the cluster analysis is performed using the text-mining software tool, a large variety of clusters emerges. In deciding the relevant number of clusters to use in this review, the researchers stopped accepting new clusters when they were too small (Milligan and Cooper, 1985), which means using a cut-off size value to identify the most appropriate cluster size. In this case, it was decided to use a cut-off value >= 300, meaning that only clusters with a size larger than 300 are accepted. The choice of cut-off value is associated with the number of clusters, this being the size value that allows isolating the 10 largest clusters for each query. Based on this, there are two distinct sets of clusters, one for each query made. The results for both queries were not joined, as the intention is to compare the

<table>
<thead>
<tr>
<th>Query 1 – VR Journal title</th>
<th>No. of articles</th>
<th>Query 2 – gamification Journal title</th>
<th>No. of articles</th>
</tr>
</thead>
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<tr>
<td>Computers and Education</td>
<td>4</td>
<td>Journal of Interactive Marketing</td>
<td>5</td>
</tr>
<tr>
<td>Computers in Human Behaviour</td>
<td>3</td>
<td>Computers in Human Behaviour</td>
<td>4</td>
</tr>
<tr>
<td>Multimedia Tools and Applications</td>
<td>3</td>
<td>Journal of Marketing Education</td>
<td>2</td>
</tr>
<tr>
<td>Electronic Library</td>
<td>2</td>
<td>Teaching and Teacher Education</td>
<td>1</td>
</tr>
<tr>
<td>Sustainability</td>
<td>2</td>
<td>Computers and Education</td>
<td>1</td>
</tr>
<tr>
<td>Rural Special Education</td>
<td>2</td>
<td>International Journal of Marketing Communication and New Media</td>
<td>1</td>
</tr>
<tr>
<td>Quarterly</td>
<td>2</td>
<td>Tourism Management</td>
<td>1</td>
</tr>
<tr>
<td>Journal of Interactive Marketing</td>
<td>2</td>
<td>International Journal of Bank Marketing</td>
<td>1</td>
</tr>
<tr>
<td>Authors</td>
<td>Theory</td>
<td>Characteristics</td>
<td>Methodology</td>
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<tr>
<td>Ma (2019)</td>
<td>Narrative persuasion and immersive media</td>
<td>Attitudes and willingness to help</td>
<td>Experiment</td>
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<tr>
<td>Tecau et al. (2019)</td>
<td>Experience with a disability, attitude barriers, physical barriers and lack of information</td>
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<td>Qualitative approach</td>
</tr>
<tr>
<td>Pappa and Papadopoulos (2019)</td>
<td>Kolb’s experiential learning model (do, observe, think, plan)</td>
<td>Learning experiences</td>
<td>Case study</td>
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<td>Wu et al. (2019)</td>
<td>AHP theoretical framework</td>
<td>Experience and purchase</td>
<td>Survey</td>
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<tr>
<td>Sun et al. (2019)</td>
<td>Bowman’s theory of interactive task</td>
<td>Interactive tasks: navigation, selection/manipulation and system control. Key factors: navigation modes, operation methods, observation scales and background options</td>
<td>Experiment</td>
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<td>Petit et al. (2019)</td>
<td>Theory of embodied cognition</td>
<td>Online experience, engagement, sensory congruency and mental imagery</td>
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<td>Cooper et al. (2019)</td>
<td>Pre-service teachers’ perceptions</td>
<td>Engage learning and experience</td>
<td>Case study</td>
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<td>Fernandez et al. (2019)</td>
<td>Learning process</td>
<td></td>
<td>Experiment</td>
</tr>
<tr>
<td>Kim and Kim (2018)</td>
<td>Peer to peer network service model</td>
<td>Learning process, progress check, result feedback between instructor and learner in real-time and system for creative English education</td>
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<td>Dyer et al. (2018)</td>
<td>Experience and empathy</td>
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<td>Case study</td>
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<td>Bum et al. (2018)</td>
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<td>Dirin and Laine (2018)</td>
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<td>da Silva et al. (2018)</td>
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<td>Pickering et al. (2018)</td>
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<td>Experience, satisfaction quality (nursing education) and change behaviour</td>
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<td>Yim et al. (2017)</td>
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<td>Fonbona et al. (2017)</td>
<td>Constructivism and connectivism (conceptual maps technique)</td>
<td>e-Learning and augmented reality</td>
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<tr>
<td>Muñoz-Cristobal et al. (2017)</td>
<td>Cooperative/collaborative learning, bricolage mode and learning buckets and orchestration</td>
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<td>Case study</td>
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Table 2. TCM framework map (continued)
<table>
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<td>Bragge et al. (2017)</td>
<td>Business simulation, dynamic decision-making (DDM) in small groups and culture</td>
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<td>Commitment and engagement</td>
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<td>Experience, communication and learning</td>
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<td>Pechenkina (2017)</td>
<td>Experience</td>
<td></td>
<td>Case study</td>
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<td>Jung and Dieck (2017)</td>
<td>Experience, co-creation, word-of-mouth and visitor intention</td>
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<td>Durl et al. (2017)</td>
<td>Dietrich et al. (2017) six-step framework</td>
<td>Active participation and engagement</td>
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<td>Fokides (2017)</td>
<td>Perceived usefulness and perceived ease of use</td>
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Table 2.
<table>
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<td>Experience, military and game applications</td>
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<td>Martin-Del-Pozo et al. (2019)</td>
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<td>Collaborative learning, experience, attitude and video game</td>
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<td>Bagal and Kaynak (2020)</td>
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<td>Motivation and integration of gamification</td>
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<td>Robson (2019)</td>
<td></td>
<td>Gamification, engagement, emotions and personal brand</td>
<td>Experiment</td>
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<td>Silva et al. (2019)</td>
<td>Flow theory</td>
<td>Gamification, game-based learning, concentration, clarity, feedback, challenge,</td>
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<td></td>
<td></td>
<td>autonomy, social interaction and perceived learning</td>
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<td>Rodrigues et al. (2019)</td>
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<td>Gamification, computer science and e-learning</td>
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<td></td>
<td>Gamification, motivation and laboratory practice</td>
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<td></td>
<td>Gamification</td>
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<td>Churchhill paradigm</td>
<td>Experience and gamified learning environment</td>
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<td>Mavroiedi et al. (2019)</td>
<td></td>
<td>User engagement, gamification and privacy requirements</td>
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Table 2. (continued)
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<th>Authors</th>
<th>Theory</th>
<th>Characteristics</th>
<th>Methodology</th>
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<tr>
<td>Hakak et al. (2019)</td>
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<td>Gamification and cloud computing education</td>
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<td>Bayuk and Altobello (2019)</td>
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<td>Gamification, financial well-being, app expertise and perceived benefits</td>
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<td>Innovation in teaching, quality in teaching, organisational commitment and student retention</td>
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<td>Active learning, digital game and game-based learning</td>
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<td>Leclercq et al. (2018)</td>
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<td>Gamification, engagement, co-creation and online community</td>
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<td>Canals and Minguell (2018)</td>
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<td>Gamification and learning</td>
<td>Case study</td>
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<td>Eppmann et al. (2018)</td>
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<td>Nousiainen et al. (2018)</td>
<td>Game-based pedagogy (GBP)</td>
<td>Gamification, pedagogical, technological, collaborative and creative</td>
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<td>Calderón et al. (2018)</td>
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<td>Motivation, engagement and meaningful gamification</td>
<td>Case study</td>
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<td>Anuncia and Kalyanaraman (2018)</td>
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<td>Gamification and e-learning</td>
<td>Case study</td>
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<td>Schwade and Schubert (2018)</td>
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<td>Gamification, e-learning and business simulation game</td>
<td>Case study</td>
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<td>Torres-Toukoumidis et al. (2018)</td>
<td></td>
<td>Gamification and e-learning</td>
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<td>Lamb et al. (2017)</td>
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<td>Practice-based learning and improvement, gamification and experience</td>
<td>Survey</td>
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<tr>
<td>Kim and Ahn (2017)</td>
<td>SDT</td>
<td>Gamification, intrinsic motivation, extrinsic motivation, loyalty, need for autonomy and reward</td>
<td>Experiment</td>
</tr>
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<td>Oleksy and Wnuk (2017)</td>
<td>Appraisal theory</td>
<td>Satisfaction, social interactions and place attachment</td>
<td>Survey</td>
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<tr>
<td>Séraphin et al. (2017)</td>
<td></td>
<td>Adaptive learning and gamification</td>
<td>Qualitative approach</td>
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<tr>
<td>Su (2017)</td>
<td></td>
<td>Meaningful gamification, rewarding interaction, brand awareness and satisfaction</td>
<td>Case study</td>
</tr>
<tr>
<td>Xu et al. (2017)</td>
<td></td>
<td>Gamification, engagement and achievement</td>
<td>Qualitative approach</td>
</tr>
<tr>
<td>Çakroğlu et al. (2017)</td>
<td></td>
<td>Gamification, engagement, performativity, marketing, infantilisation, surveillance, gamification and opposition</td>
<td>Conceptual</td>
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<td>Macfarlane and Tomlinson (2017)</td>
<td></td>
<td>Experience, engagement and gamification</td>
<td>Case study</td>
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<td>Jurado and Echeverria Meza (2017)</td>
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<td>Experience, engagement and gamification</td>
<td>Case study</td>
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<tr>
<td>Gañán et al. (2017)</td>
<td></td>
<td>Gamification, VR, sensitisation and engagement</td>
<td>Case study</td>
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<tr>
<td>Durl et al. (2017)</td>
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Table 2.
results from Query 1 (VR) and Query 2 (gamification) and find similarities and differences from this analysis. Table 3 presents the results for both queries.

Starting by analysing the results of the clusters for query 1 (Table 3), the main clusters are related to VR and virtual environments, which is an expected result. Analysing the rest of the clusters, the second largest group is related to education and teaching, followed by the user’s experience (both as immersive virtual experience and other aspects of experience). Finally, the student engagement cluster emerges, which, combined with the topics mentioned above, warrants further investigation. The same analysis is made for the second query on gamification (Table 3). The results show that the main clusters are related to experience and context analysis, aligned with the results for Query 1. The second group of clusters is related to platforms, applications and game elements, which is also an expected result. Another group of clusters is related to learning environments and teaching methodologies and courses in Marketing, followed by the clusters of student engagement and intrinsic motivations.

Based on this analysis and the set of results, it is possible to identify emerging latent topics. An interconnection of topics is perceived among the clusters from each query, and
between the two distinct groups of clusters (Table 3) and the results can be aggregated into five major latent topics which are proposed below and considered for further analysis.

### 3.3 Latent topics

**Topic 1. Applied theories in VR.** According to Loureiro *et al.* (2019c), four main theories support studies on VR: self-expansion theory, the theory of planned behaviour (TPB), unified theory of acceptance and use of technology (UTAUT) and stimulus-organism-response (S-O-R) Theory. The last two theories tend to be used more often (Loureiro *et al.*, 2019c).

The first (self-expansion theory) lies in the assumption that consumers desire and can accomplish their goals, and so self-expansion is related to psychological models of self-efficacy, intrinsic motivation, self-actualisation and self-improvement motivation. Hence, the self is created through relationships with close others and these relationship partners can draw out otherwise hidden aspects of the self to create greater wholeness (Aron *et al.*, 1998).

TPB claims that subjective norms, attitudes towards behaviour and perceived behavioural control, together shape a consumer’s behavioural intentions and actual behaviours (Ajzen, 1991). Here, subjective norms are the person’s beliefs about whether other people approve or disapprove of the behaviour. Attitude means the degree to which a person has a favourable or unfavourable evaluation of the behaviour of interest. Perceived behavioural control refers to a consumer’s perception of the ability (ease or difficulty) of performing the behaviour of interest. Finally, behavioural intentions are the motivational factors that influence a given behaviour. A strong behavioural intention may lead to actual behaviour.

UTAUT (Venkatesh *et al.*, 2003) is a unified model of the well-known TAM model suggested by Davis *et al.* (1989). Technology acceptance model (TAM) comprises the perceived usefulness (the degree to which a consumer believes that using a technological system enhances their performance) and perceived ease-of-use (the degree to which consumers believe that using a technological system implies effort) as two main drivers of attitude and behavioural intentions. UTAUT provides a unified view to explain users’ acceptance of new technology and acts as a baseline for new technologies inside organisations (Venkatesh *et al.*, 2003). Afterwards, UTAUT is extended to the consumer use...
context (Venkatesh et al., 2012), by including hedonic motivation, price value and habit and UTAUT2 emerged. Mehrabian and Russell (1974) propose the S-O-R framework from the perspective of environmental psychology. Afterwards, S-O-R was introduced in the retail context by Donovan and Rossiter (1982). In retail – both online and offline – the stimulus is operationalised as the atmospheric cues, the organism as consumers’ emotional and cognitive states and the response as approach or avoidance behaviours (e.g. intention behaviour, re-patronage or store search). S-O-R has provided the theoretical basis also in m-commerce (Huang, 2017) and emerging technologies including VR (Kim et al., 2018) or the tourism context (Flavián et al., 2019b; Flavián et al., 2020; Loureiro et al., 2014). Environmental stimuli or atmospheric cues or even the stimuli provided by an experience initiate the perceptual, physiological, feeling and thinking activities and cause a change in the consumer’s cognitive and emotional state (Roschk et al., 2017; Sherman et al., 1997). The thinking and feeling activities (Organism) intervene in the relationship between the stimulus and the consumer’s responses (Roschk et al., 2017).

**Topic 2. Applied theories in gamification.** Following Kapp (2012, p. 10), “gamification is using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning and solve problems”, whereas Zichermann and Cunningham (2011, p.14) consider gamification as “the process of game-thinking and game mechanics to engage users and solve problems”. Huotari and Hamari (2012, p. 20) define from a marketing perspective as “a process of enhancing a service with affordances for gameful experiences to support user’s overall value creation”. However, the most common definition is provided by Deterding et al. (2011, p.13), as “the use of game design elements in non-game contexts”. Hence, gamification is an umbrella term focussing on the use of game elements instead of fully-fledged games to improve user experience and engagement in non-game contexts (Deterding et al., 2011), including education. Gamification has its support in motivational theories which include self-determination theory (SDT), self-regulation theory and flow theory.

SDT highlights that an understanding of human motivation requires consideration of innate psychological needs for competence, autonomy and relatedness, leading individuals to have intrinsic and extrinsic motivation to achieve a specific goal. Indeed, individuals are motivated to grow and evolve because of three needs – competence, connection and autonomy. The theory also points out that extrinsic motivators need to be continuous because individuals become addicted to them (Deci and Ryan, 2000).

Self-regulation theory refers to the ability to moderate the thoughts and emotions that govern human behaviour (Leventhal et al., 1984), which one could argue as a sequel to SDT. Indeed, self-regulation has direct associations with motivation (Bandura, 1991), which can be perceived as the motivation to achieve success and is connected to self-discipline and adherence to the strategies that encourage goal achievement.

Finally, the flow theory proposed by Csikszentmihalyi (1990) indicates that flow is an optimal psychological state that individuals experience when engaged in a challenging activity, often resulting in immersion and concentrated focus on a certain task.

**Topic 3. Experience and motivation.** One of the first authors to claim the importance of experience is Abbott (1955, p.40) saying that “what people really desire are not products but satisfying experiences”. In the 1980s, theories emerge in experiential marketing (Hirschman and Holbrook, 1982). Hirschman and Holbrook (1982) study hedonic versus utilitarian consumption, where hedonic consumption represents the multisensory and emotional aspects of consumers’ interactions with goods and services, whereas utilitarian consumption is associated with goods and services which are necessary for survival, to fulfil basic needs.
However, the roots of customer experience may start in the 1960s when Howard and Jagdish (1969) showed interest of researching the topic.

The 1970s and 1980s are devoted to research focused on the buying behaviour process, customer satisfaction and service quality. Satisfaction emerges with cognitive and emotional components (Oliver, 1980; Westbrook and Oliver, 1991), followed by the importance of customer delight (Loureiro et al., 2014; Oliver et al., 1997). The effects of satisfaction on loyalty or intention behaviour are extensively confirmed in several studies (Gupta and Zeithaml, 2006).

The 1990s feature models and scales to measure service quality such as SERVQUAL and SERVPERF. In these years, the discussion about the process to measure quality and the best way to use the scales were very prominent (Cronin and Taylor, 1994; Parasuraman et al., 1988), followed by the rise of relationship marketing as a new field in marketing research, focused on a long-term relationship where both the buyer and seller have an interest in a more satisfying exchange, using the experience to create stronger relationships with customers (Sheth and Parvatiyar, 1995).

The 21st century has seen advanced customer relationship management, paving the way to customer experiences and engagement (Badenes et al., 2019; Brodie et al., 2011; Hollebeek et al., 2014), exploring how organizations can take advantage of customer engagement (Kumar and Pansari, 2016; Rather et al., 2018). Probably, the next steps on this journey will be the development of further studies on the relationship between brands (or non-human mechanisms), humans and devices (Orús et al., 2019), through distinct emerging concepts such as what a brand coolness/device coolness relationship could be (Warren et al., 2019).

The conceptualization of consumer experience has two major perspectives: experience economy and brand experience. The first perspective is developed by Pine and Gilmore (1998) and considers that experiences occur when firms use services as stages and transform events in memorable experiences. Pine and Gilmore (1998) present the realms of the experience using two axes. In one axis, there is active or passive participation, whereas education and escapism are on the active side. Education represents the stimulation to learn something new and escapism means immersion in a different time or place. These two facets belong to different parts of the y-axis, that is, education is absorption (being focused) and escapism is immersion (being completely in a different place) (Billingsley and Scheuermann, 2014; Jung and tom Dieck, 2017; Loureiro et al., 2014). Regarding entertainment, this facet is located in passive and absorption axes suggesting that the activities are fun to watch. Finally, aesthetics (passive and immersion) represents the setting where the experience occurs.

The second perspective, brand experience, was initially proposed by Brakus et al. (2009) and is conceptualized as sensations, feelings, cognitions and behavioural responses evoked by brand-related stimuli that are part of a brand’s design and identity, packaging, communications and environments. These authors propose four dimensions for brand experience: sensory, which is related to aesthetics and sensory perceptions; affective, which relies on affect and emotions; behavioural, which is connected with actions when using the brand; and intellectual, which reflects the fact that the brand stimulates curiosity.

**Topic 4. Teaching methodologies and education.** Teaching means that someone should be interested in learning (Schunk, 2012), so to have the right teaching approach one should also learn about “learning”, thus ensuring that learning takes place in the classroom. Therefore, when we observe some of the research by distinct educational psychologists — behaviourist, constructivist and cognitive psychologists — (Agarkar, 2019; Illeris, 2009; Schunk, 2012), several different definitions of learning arise. Based on the definitions presented by Pritchard (2009, p. 2), learning is “a change in behaviour as a result of the experience of
practice” and the acquisition of knowledge is “to gain knowledge of or skill in, something through study, teaching, instruction or experience”.

One of the biggest challenges faced by lecturers is to be able to capture and retain students’ attention, in such a way they can assimilate the teachings and concepts even after they leave the classroom. So, all classroom experiences should be re-evaluated, and new innovative ideas to create a more effective teaching-learning process should be tested and implemented (Kalyani and Rajasekaran, 2018; Kim et al., 2013).

Lecturers can choose from various teaching methodologies and apply those that best suit the needs and circumstances where the teaching-learning process takes place. When choosing teaching methodologies, teachers also need to reflect on how they intend to conduct their classes – a more teacher-centred approach, where teachers are the leading authority or a more student-centred approach, where teachers and students play a similarly active role in the learning process (Lasry et al., 2014; Sesen and Tarhan, 2011).

Some examples of teacher-centred methods of instruction are “flipped classrooms” (O’Flaherty and Phillips, 2015), where students prepare for their in-class assignments at home, watching pre-recorded lessons. Another example is the “direct instruction” method, the more traditional method based on teaching through lectures (O’Flaherty and Phillips, 2015). Regarding student-centred methods of instruction, some examples are “problem-based learning” (Jalani and Sern, 2015), where students are asked to solve problems collaboratively. A similar method is “project-based learning”, repeatedly confused with the previous method, but with the difference that here it is the student who has to present a problem or question to investigate (Hmelo-Silver, 2004; Jalani and Sern, 2015).

The emergence of new teaching and learning tools and technologies is also a permanent challenge for educators at all levels of education, creating a need for permanent updating on their functioning, usefulness and application in the classroom, which leads to an increase in research on how students learn and respond to different teaching methods (Nilson, 2010). This has been the case with gamification (Çakıroğlu et al., 2017; Marti-Parreño et al., 2016; Subhash and Cudney, 2018) and VR (Bhattacharjee et al., 2018; Fernandez, 2017; Janssen et al., 2016; O’Connor and Domingo, 2017), as they are receiving increasing attention and research in the field of education and particularly in higher education, proving to be valid tools both in supporting the teaching-learning process and in arousing increased interest and involvement among students. Several authors, such as Englund et al. (2017) and Kim et al. (2013) claim that the successful use and implementation of some of these educational technologies, as they are mostly dependent on and integrated with various technological supports, means that teachers who want to use them should have some knowledge of how to integrate them into their teaching process.

Technology alone is not enough to change the learning environment. For that to happen, and intense intervention should also occur so that technology follows the teaching and learning strategies, seeking to ensure students’ acquisition of knowledge based on digital resources (Marcelo et al., 2015). The use of technology in education also raises several barriers for educators, not only because of the learning curve but also because of the implementation of teaching methods and pedagogical approaches that can generate benefits. Educators need a better understanding of some of the benefits of using technology, especially those that promote greater interest and autonomy among students (Alonso et al., 2019; Sinclair and Aho, 2017).

Topic 5. Student engagement. Stakeholders must become engaged in actively cooperating with organisations to plan, develop, co-create or improve what already exists (Loureiro et al., 2019b). Organisations, whether companies, NGOs or higher education institutions need to know how to stimulate innovation through their stakeholders’
engagement (Huggins and Thompson, 2015; Ramaswamy and Ozcan, 2018; Shams and Kaufmann, 2016). The literature has already studied the link between distinct stakeholders’ engagement, such as consumers, suppliers, shareholders or students, from different perspectives (Loureiro et al., 2019b; Monferrer et al., 2019).

Researchers have been attempting to understand engagement between firms and distinct stakeholders such as consumers (Bilro et al., 2019; Brodie et al., 2011; Hollebeek et al., 2014; Loureiro et al., 2019a; Pansari and Kumar, 2017; Sprott et al., 2009). Research in this domain is not new, as it has been discussed in areas such as psychology or sociology (Garczynski et al., 2013; Morimoto and Friedland, 2013). Moreover, technological advances have provided people with global communication platforms that promote interaction to exchange information and knowledge (Chen et al., 2010; Dessart et al., 2019). In these online environments, consumers may seek relevant information to make decisions and/or achieve something in their lives (Brandão et al., 2019; Sicilia and Palazón, 2008). So, consumer engagement can be described as a cognitive and affective commitment to an active relationship with the brand as personified by the technology to communicate a specific firm value (Mollen and Wilson, 2010).

Concerning students, a relative consensus emerges in the literature concerning motivation as one of the driving sources for engagement (Ketyi, 2016; Macfarlane and Tomlinson, 2017; Robson, 2019). Motivation can affect students’ behaviour or action in a specific environment (Appleton et al., 2008; Skinner et al., 2009). The effect of motivation on students is that the more they are motivated to learn, the more likely it is they will be engaged in learning activities (De Guimarães et al., 2019; Kim et al., 2015). Motivation can be seen as a two-fold concept:

1. controlled motivation; and
2. autonomous motivation (Ryan and Deci, 2000b, 2000a).

First, controlled motivation appears in student behaviours to respond to external stimuli, such as commenting on peers’ discussion board postings to earn a mark for participation (Ryan and Deci, 2000b). In autonomous motivation, student behaviour is consistent with other values and needs (Ryan and Deci, 2000b). Considering these two distinct types of motives, we can see that students with autonomous motivation are more willing to engage in online discussions than students with controlled motivation. Students with autonomous motivation may behave more actively (Xie et al., 2006), maybe more individualistic and collaborative or sustain their actions in cognitive engagement (Xie and Ke, 2011).

Although not consensual in the literature, student engagement can be defined as their psychological investment and behavioural involvement in learning activities (Appleton et al., 2008). Moreover, student engagement is often defined as a multidimensional construct and is usually defined as having three dimensions, namely, behavioural engagement, cognitive engagement and emotional or affective engagement (Fredricks et al., 2004; Jimerson et al., 2003). If we look more deeply into the literature, most research about this topic is found to relate behavioural engagement with students’ participation, observation of rules in the classroom and involvement in learning activities (Finn and Voelkl, 1993; Fredricks et al., 2004; Jimerson et al., 2003). Behavioural engagement in online contexts can usually be through discussions or replies to peers. Several authors argue that the number of discussions among peers can be perceived as an indicator of behaviour engagement (Goggins and Xing, 2016). In line with this, research also observed an exciting relationship between discussions among students and achievements (Ramos and Yudko, 2008). Nevertheless, this relationship tends only to exist when discussions are needed.
Concerning emotional engagement, research defined this as students’ psychological response to academic environments, such as the feeling of boredom or enjoyment from learning activities (Finn and Zimmer, 2012). It can also be influenced by the relationship with tutors or lecturers and their peers (Fredricks et al., 2004). In the online context, emotional engagement can be linked to students’ interests or enjoyment in being part of online conversations and based on social interactions with tutors and colleagues.

Finally, cognitive engagement can be perceived as the idea of expending extra effort to understand multifaceted concepts and/or to master upscaled skills (Finn and Zimmer, 2012; Fredricks et al., 2004). The relevance of this third dimension of cognitive engagement was also perceived and noted in distinct online contexts (Garrison et al., 2000; Putman et al., 2012; Zhu, 2006). Cognitive engagement in online discussions can be stated as the attention and the effort that students spend on interacting through discussions, posts or comments with their peers or tutors (Garrison et al., 2000). It involves the use of multifaceted concepts and/or students’ upscale skills, such as analysing, critiquing or reasoning (Putman et al., 2012; Zhu, 2006).

Table 4 summarises the five latent topics, key theories and correlated papers.

4. Directions for future research
This literature review demonstrates that this field is still rife with many unexplored areas for further study. We divide our recommendations into three distinct, but related aspects, namely, theory, characteristics and methodology. We also suggest research questions that emerge from the literature as a whole and others that come from specific articles analysed.

The question as to how this lack of answers can be rectified comes from novel contributions that continue to be highly valued by this research field, particularly given the fast-paced nature of technological innovation that underpins much of interactive marketing space nowadays. In addition, however, we recommend that research building directly on prior work in a meaningful, relevant and constructive way should also be considered.

4.1 Theory: new research directions
The majority of the papers analysed (Table 2) tend to be descriptions of practices, cases and examples of applications of VR and gamification for the purpose of learning. Thus, the theories supporting the research analysed tend to be dedicated to the learning process (Cooper et al., 2019; Petit et al., 2019; Sun et al., 2019; Pappa and Papadopoulos, 2019; Doumanis and Smith, 2015). However, we also find theories usually associated with the marketing field, for instance, SERVQUAL/SERVPERF for service quality (Pickering et al., 2018), theories in marketing connected to the adoption of new technologies TAM (Fokides, 2017) or UTAUT (Koivisto and Hamari, 2014). Other theories come from psychology, sociology or biology and are often used in the marketing field, such as appraisal (Oleksy and Wnuk, 2017), self-determination (Kim and Ahn, 2017), S-O-R (Suh and Prophet, 2018) or the flow that is used in the games field (Silva et al., 2019). In this review, we note a deficiency in the use of theories to support each research. Therefore, other theories or the combination of two or more theories used in marketing can be considered in the future, for instance: congruity theory (attitude change towards learning), social identity (modify students’ self-identity or part of their self-concept that derives from the knowledge learned and interpreted) or value-belief-norm (norms are active when students believe that violating them would have adverse effects on what students value). New theoretical lenses that can be specific to this context of using technologies to enhance the learning process in marketing will boost our knowledge. Hence, the following research questions are suggested:
<table>
<thead>
<tr>
<th>Topic name</th>
<th>Key theories and concepts</th>
<th>Topic terms and explanation</th>
<th>Correlated papers</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1. Foundation theories in VR</td>
<td>Self-expansion theory</td>
<td>Self-expansion is related to psychological models of self-efficacy, intrinsic motivation, self-actualisation and self-improvement motivation</td>
<td>Aron et al. (1998)</td>
</tr>
<tr>
<td></td>
<td>TPB</td>
<td>Subjective norms, attitude toward behaviour and perceived behavioural control, together shape a consumer’s behavioural intentions and actual behaviours</td>
<td>Ajzen (1991)</td>
</tr>
<tr>
<td></td>
<td>UTAUT</td>
<td>Unified view to explain user’s acceptance of new technology and acts as a baseline for new technologies; comprises the perceived usefulness and perceived ease-of-use as two main drivers of attitude and behavioural intentions</td>
<td>Davis et al. (1989); Venkatesh et al. (2003, 2012)</td>
</tr>
<tr>
<td></td>
<td>S-O-R</td>
<td>The stimulus is operationalised as the atmospheric cues, the organism as consumers’ emotional and cognitive states and the response as approach or avoidance behaviours</td>
<td>Donovan and Rossiter (1982); Mehrabian and Russell (1974)</td>
</tr>
<tr>
<td>T2. Foundation theories in gamification</td>
<td>SDT</td>
<td>Understanding of human motivation requires consideration of innate psychological needs for competence, autonomy and relatedness, leading individuals to have intrinsic and extrinsic motivation to achieve a specific goal</td>
<td>Deci and Ryan (2000)</td>
</tr>
<tr>
<td></td>
<td>Self-regulation theory</td>
<td>The ability to moderate the thoughts and emotions that govern human behaviour. Has direct associations to motivation to achieve success, self-discipline and adherence to the strategies that encourage goal achievement</td>
<td>Bandura, (1991); Leventhal et al. (1984)</td>
</tr>
<tr>
<td></td>
<td>Flow theory</td>
<td>Flow is an optimal psychological state that individuals experience when engaged in an activity that is challenging, often resulting in immersion and concentrated focus on a certain task</td>
<td>Csikszentmihalyi (1990)</td>
</tr>
<tr>
<td>T3. Experience, user experience and motivation</td>
<td>Experience economy</td>
<td>Experiences occur when firms use services as stages and transform events in memorable experiences. Four realms of experience are presented, namely, entertainment, educational, aesthetic and escapism</td>
<td>Pine and Gilmore, (1998)</td>
</tr>
<tr>
<td></td>
<td>Brand experience</td>
<td>Sensations, feelings, cognitions and behavioural responses evoked by brand-related stimuli that are part of a brand’s design and identity, packaging, communications and environments</td>
<td>Brakus et al. (2009)</td>
</tr>
<tr>
<td></td>
<td>Teacher-centred approach</td>
<td>Teachers are the leading authority</td>
<td></td>
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</tbody>
</table>

Table 4. Latent topics, key theories and correlated papers (continued)
RQ1. What theories often used in the marketing field could be adapted and combined to give support to studies on the learning process context using VR and gamification?

RQ2. How to develop a specific theory on the learning process context, using VR and gamification?

4.2 Characteristics: new research directions
A substantial body of research is focussed on concepts and constructs such as experience, engagement, emotions, satisfaction, immersive technologies and gamification (Table 2) (Robson, 2019; Göksun and Gursoy, 2019; Baydas and Cicek, 2019; Cooper et al., 2019; Navarro et al., 2017; Bower et al., 2017). The meaning of these concepts is presented in Sections 4.1 and 4.3. Further research can explore concepts such as co-creation (a joint process of learning among students and/or among lecturers, educators, students and enterprises). The learning process is no longer just an in-person relationship between students and an educator in the classroom. The learning system is evolving to a complex network connecting different actors (e.g., students, lecturers, enterprises, researchers and other stakeholders of higher education institutions) in a community where virtual and real environments are combined. Thus, some research questions arise:

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<table>
<thead>
<tr>
<th>Topic name</th>
<th>Key theories and concepts</th>
<th>Topic terms and explanation</th>
<th>Correlated papers</th>
</tr>
</thead>
<tbody>
<tr>
<td>T4. Teaching methodologies and education</td>
<td>Student-centred approach</td>
<td>Teachers and students play a similarly active role in the learning process</td>
<td>Lasry et al. (2014); Senen and Tarhan (2011)</td>
</tr>
<tr>
<td></td>
<td>Flipped classrooms</td>
<td>Students prepare for their in-class assignments at home, watching pre-recorded lessons</td>
<td>O’Flaherty and Phillips (2015)</td>
</tr>
<tr>
<td></td>
<td>Direct instruction method</td>
<td>The more traditional method based on teaching through lectures</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Problem-based learning</td>
<td>Where students are asked to solve problems collaboratively</td>
<td>Jiali and Sern (2015)</td>
</tr>
<tr>
<td></td>
<td>Project-based learning</td>
<td>Where the student has to present a problem or question to investigate</td>
<td>Hmelo-Silver (2004); Jiali and Sern (2015)</td>
</tr>
<tr>
<td></td>
<td>Student engagement</td>
<td>Students’ psychological investment and behavioural involvement in learning activities</td>
<td>Appleton et al. (2008)</td>
</tr>
<tr>
<td>T5. Student engagement</td>
<td>Behavioural engagement</td>
<td>Students’ participation, observation of rules in the classroom and involvement in learning activities</td>
<td>Finn and Voelkl (1993); Fredricks et al. (2004); Jimerson et al. (2003)</td>
</tr>
<tr>
<td></td>
<td>Emotional engagement</td>
<td>Students’ psychological response to academic environments, such as the feeling of boredom or enjoyment from learning activities</td>
<td>Finn and Zimmer (2012); Fredricks et al. (2004)</td>
</tr>
<tr>
<td></td>
<td>Cognitive engagement</td>
<td>The idea of spending extra effort to understand multifaceted concepts and/or to master upscaled skills</td>
<td></td>
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</table>

Table 4.
RQ3. How can we build a learning community that allows an integrative educational process? An integrated learning process tends to narrow the gap between educators and students, through creating and implementing new approaches to teaching and learning, using a comprehensive set of teaching tools and methods able to improve students’ engagement, motivation and learning outcomes.

RQ4. How to implement an integrated process of learning using gamification and VR, bringing onboard the total cooperation of stakeholders (institutions, educators and students)?

RQ5. How to develop a collaborative system where lecturers and students can create and discuss their experiences from using multimedia lectures and the knowledge benefits gained?

RQ6. What are the best methods to disseminate and encourage educators to explore and learn about new technologies applied to teach?

RQ7. What is the impact of the coopetition settings increasingly used to design co-creation platforms? (Leclercq et al., 2018)

RQ8. What are the strategies that can be used to keep the gamified activity engaging, following a win/lose decision? (Leclercq et al., 2018)

RQ9. Can some dimensions of gameful experiences, such as enjoyment, explain the gameful experience consumers feel when they engage with gamified applications? (Eppmann et al., 2018)

RQ10. Can the perceptions of experience lead to engagement? What might be the mediators between experience and engagement? (Loureiro et al., 2020)

RQ11. Are stakeholders (such as students, consumers or others) more dependent on visualised information (i.e. visual learner) than on text-based information? (Yim et al., 2017)

RQ12. What is the relationship between brands (or non-human mechanisms), humans and devices, through distinct emerging concepts such as what a brand coolness/device coolness relationship could be? (Warren et al., 2019)

4.3 Methodology: new research directions
Case studies, followed by surveys, are the most commonly used methodologies (Table 2). The sample size tends to range between 100 and 300 (Koivisto and Hamari, 2014; Cho et al., 2015; Fokides, 2017; De Guimarães et al., 2019). A small number of studies (10) use a mixed approach, where authors consider the combination of survey/experiment and a qualitative technique (e.g. interviews, focus group and content analysis) (e.g. Anstadt et al., 2013; Ali, 2015; Başal and Kaynak, 2020). The studies using surveys and experiments tend to use structural equations, regression analysis or factorial analysis for data treatment (Fokides, 2017; Silva et al., 2019). Another group of studies is more conceptual, attempting to discuss previous studies, presenting frameworks and suggesting plans to implement learning practices) (Mavroeidi et al., 2019; Torres-Toukoumidis et al., 2018). Living lab experiments are becoming a differentiated methodology in the group of experiments (Avellis et al., 2015a, 2015b; Ma, 2019). Only one study is devoted entirely to network analysis (Harman et al., 2014). Therefore, the challenge is to develop methodologies that can aggregate a community.
of educational stakeholders, which together can transform the traditional way to teach and learn. The following research questions are proposed:

**RQ13.** What technological tools and teaching methods could be used simultaneously to promote students’ engagement and academic success?

**RQ14.** Which teaching methods and technologies could be widely tested in higher education institutions to ensure the best learning outcomes?

**RQ15.** How can 5G technology contribute to enhancing the learning process using VR and gamification?

**RQ16.** What is the influence of factors such as screen size, image motion, stereoscopic presentation or a realistic and detailed design on VR experiences? (Loureiro et al., 2019a, 2019b, 2019c)

**RQ17.** For how long does a mobile augmented reality application succeed in supporting its users’ emotional engagement? (Dirin and Laine, 2018)

**RQ18.** How can the integration of VR into cyber-physical systems and the Internet of Things induce innovative education services in the near future? (Kim et al., 2018)

**RQ19.** How can the student’s interest be enhanced through speech recognition functions, and be used as the educational method to increase experience and engagement? (Kim and Kim, 2018)

**RQ20.** How do offline and online environments differ in terms of multisensory information processing? How can the optimal personalised multisensory balance be assessed? (Petit et al., 2019)

5. Conclusions, implications and limitations

Recent technologies such as VR and gamification are gaining attention in the field of marketing research, and more specifically, in the marketing of services such as education. Through VR and gamification, it is possible to build different teaching scenarios and approaches to be able to collect and understand students’ reactions, motivation and engagement in their experience with these scenarios and teaching methods. Services in general, and educational methods in particular – especially some of the teaching methods used in higher education- are increasingly subject to the pressure of recent technologies, to supply newer alternatives to support the mission to spread knowledge and to motivate all stakeholders (e.g. students, educators, enterprises). Hence, understanding how to engage students with their subjects may contribute not only to learning strategies but also to services, and society as a whole.

The current research also offers insights for managers. Firstly, managers must perceive gamification and VR in services as having several characteristics linked to users’ interactions, as identified in the literature. Managers should be able to understand and design these interactions to achieve the desired results. Secondly, by interacting and participating, users/participants create levels of engagement. Gamification, specifically, is being used nowadays mainly for educational purposes and market research, with the results of engagement varying amongst studies. The results of this systematic review show that gamification has a positive impact on engagement, especially in the short term. So managers should devote time to determining the effectiveness of gamification in different settings and investigate how gamification can be used to increase long-term engagement with services in general. Thirdly,
our research shows that applications with realistic surroundings and which are easy to use by lecturers and students are the basic design requirements for educational VR purposes. Managers should adopt this same strategy either for educational or general service organizations. Fourthly, most articles describe VR applications for knowledge sharing, with a focus on curricula and declarative knowledge. Managers can observe this reality as an opportunity to use VR in a more practice-oriented context, offering opportunities to users/participants to learn/know by doing/using/visiting. Fifthly, by revisiting our findings and our research agenda, we claim that the existing literature does not present so far a comprehensive set of recommendations or best practices for managers. Therefore, managers should use our results and findings as an initial list of different scenarios to help them decide when to use VR or gamification, for what purpose and what technology to use.

Due to the nature of this literature review, and its selection and filtering process, this work is not without its limitations. Firstly, it was not possible to perform a meta-analysis due to the large degree of heterogeneity in the studies included in this review. Secondly, it is important to identify the possibility of publication biases, as the search was limited to English and peer-reviewed papers available on a single database, which may limit the number of potential papers identified and included in this review. Nevertheless, none of these limitations detracts from the value of the present research. Indeed, they provide an opportunity to advance research in this domain.

References


Illeris, K. (2009), *Contemporary Theories of Learning, Contemporary Theories of Learning*, 2nd ed., Routledge, available at: [https://doi.org/10.4324/9780203870426](https://doi.org/10.4324/9780203870426)


Virtual reality and gamification


**Further reading**


<table>
<thead>
<tr>
<th>Element</th>
<th>0: Absence</th>
<th>1: Low level</th>
<th>2: Medium level</th>
<th>3: High level</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Directly related to the objective of the research</td>
<td>There is not enough information to evaluate this criterion</td>
<td>Not related</td>
<td>Somehow related</td>
<td>Totally related</td>
<td>Not applicable</td>
</tr>
<tr>
<td>2. Theory robustness</td>
<td>There is not enough information to evaluate this criterion</td>
<td>Weak development of literature</td>
<td>Superficial development of theories and constructs within the existing literature</td>
<td>Robust use of theory</td>
<td>Not applicable</td>
</tr>
<tr>
<td>3. Congruence of theory, methodology and findings</td>
<td>There is not enough information to evaluate this criterion</td>
<td>Incomplete data and not related to the theory</td>
<td>Data somehow related to the arguments</td>
<td>Strong link between the arguments presented and data</td>
<td>Not applicable</td>
</tr>
<tr>
<td>4. Contributions to theory and/or practice</td>
<td>There is not enough information to evaluate this criterion</td>
<td>Makes a low contribution</td>
<td>Makes a medium contribution</td>
<td>Makes a high contribution</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Table A1. Quality criteria
About the authors
Sandra Maria Correia Loureiro (PhD) is a professor at ISCTE- Instituto Universitário de Lisboa. She is the director of PhD in Tourism Management and head of research in marketing, where she coordinates the specialization in marketing of the PhD in Management. Her current research interests include consumer-brand relationships and tourism marketing issues connected to VR, AR and AI. Her papers have been published in a variety of peer reviewed journals that include Journal of Marketing, Journal of Retailing, Tourism Management, Journal of Business Research, International Journal of Hospitality Management, Journal of Hospitality Marketing and Management, Journal of Hospitality and Tourism Technology, Journal of travel and tourism marketing, international journal of tourism research, current issues in tourism. Her work has also been presented at respected international conferences such as World Research Summit for Tourism and Hospitality, EMAC, ANZMAC, and KAMS-GMC. Sandra serves as a reviewer for several international journals and conferences and has participated in several research projects funded by the EU and FCT (Foundation for Science and Technology). Sandra Maria Correia Loureiro is the corresponding author and can be contacted at: sandramloureiro@netcabo.pt

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Fernando José de Aires Angelino holds a Master in Management and now he is a candidate of the PhD in Management from ISCTE- University Institute of Lisbon. He is an invited lecture in higher education institutions. He also embraced several management tasks at several enterprises (e.g., Herbalife, Levi Strauss and co., Nokia Portugal, S.A.)