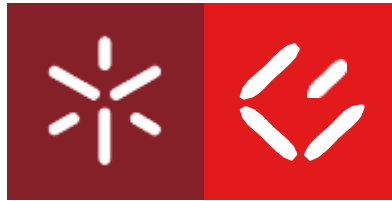




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Escola de Economia e Gestão

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Student satisfaction and co-creation behavior in game-based Learning environment in higher education



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Student satisfaction and co-creation behavior
in game-based learning environment in higher
education

Ph.D. Thesis
Ph.D. in Marketing and Strategy

A work made under the supervision of
Professor Ana Maria Soares
And
Professor Helena Alves

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Statement of Integrity

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration.

I further declare that I have fully acknowledged the Code of Ethical Conduct of the University of Minho.

Satisfação do aluno e comportamento de cocriação em ambiente de aprendizagem baseado em jogos no ensino superior

Resumo

À medida que a concorrência aumenta, é essencial que os prestadores de ensino superior (ES) tentem desenvolver e oferecer experiências de serviço de alta qualidade. O valor no contexto educacional é apresentado como uma ferramenta para que as instituições de ensino superior (IES) levem a cabo o planejamento estratégico e a orientação para o mercado, compreendam, gerenciem e impactem as percepções de valor entre todos os alunos. Baseando-se na investigação atual sobre a satisfação do aluno na aprendizagem baseada em jogos (GBL), a presente tese visa apresentar uma revisão sistemática da literatura sobre os antecedentes da satisfação do aluno, a percepção de valor e o comportamento de cocriação no ambiente GBL no ES, a fim de mapear as pesquisas existentes sobre estes temas e oferecer uma visão consolidada de como a cocriação pode contribuir para a criação de valor mútuo para IES e alunos e como a percepção do valor do aluno pode contribuir para a satisfação do aluno. A presente tese analisa e discute criticamente o estado da arte dos papéis e comportamentos de cocriação dos estudantes no ES e desenvolve um modelo de investigação que inclui o impacto da cocriação no valor percebido pelo estudantes e, subsequentemente, na satisfação.

A tese inclui três revisões sistemáticas da literatura. Um total de 128 (primeira e segunda revisão sistemática da literatura) e 88 (terceira revisão sistemática da literatura) artigos de periódicos acadêmicos foram sistematicamente analisados utilizando abordagens qualitativas e quantitativas para o estudo. Foi realizado um estudo empírico com duas entrevistas informais com docentes do ensino superior do IBA na Dinamarca e um questionário com uma amostra de 320 alunos. A análise dos dados foi feita com Modelos de Equações Estruturais (SEM). Os resultados revelam várias relações significativas entre comportamento de cocriação, percepção de valor e satisfação do estudante. Além disso, os resultados suportam a relação entre o comportamento de cocriação do aluno e sua satisfação num contexto de GBL no ES. Além disso, os resultados mostram que a percepção de valor do aluno impacta positivamente a satisfação do aluno com GBL no ES.

A contribuição desta tese para a literatura sobre satisfação do aluno e comportamento de co-criação é quádrupla. Primeiro, concentra-se especificamente na percepção do estudante sobre o valor do ES e na satisfação do estudante no ES. Em segundo lugar, a tese fornece uma classificação detalhada e abrangente de estratégias de cocriação em ES e dos seus benefícios para estudantes e IES. Além disso, examina separadamente, pela primeira vez, o efeito do GBL na satisfação do estudante e analisa a percepção do estudante sobre o valor do GBL no ES. Terceiro, adapta e mede a influência do comportamento de cocriação do aluno na sua percepção do valor do GBL no ES. Em quarto lugar, a presente tese considera, pela primeira vez, o papel mediador desempenhado pelo valor percebido dos estudantes na sua integração e envolvimento alunos ao integrá-los e envolvê-los em

atividades de cocriação no ES. Finalmente, com base nos resultados, várias implicações para a gestão são sugeridas para IES, docentes e desenvolvedores de projectos de ensino.

Palavras-chave: Aprendizagem baseada em jogos, Satisfação, Cocriação, Coprodução, Valor em uso, Percepção de valor, Estudantes, Ensino superior

Student Satisfaction and co-creation behavior in Game-based Learning Environment in Higher Education

Abstract

As competition increases, it is essential that higher education (HE) suppliers endeavor to develop and offer high-quality service experiences. Value in the education context is presented as a tool for higher education institutions (HEI) to drive strategic planning and market orientation, comprehend, manage, and impact value perceptions among all students. Drawing on current literature research on student satisfaction in game-based learning (GBL), the current thesis aims at presenting a systematic review on student satisfaction antecedents, student perception of value and co-creation behavior in GBL environment in HE in order to map extant research on these topics and offer a consolidated view of how co-creation may contribute to creating mutual value for HEIs and students and how student's perception of the value may contribute to student satisfaction. We analyze and critically discuss the state of the art of student co-creation roles and behavior in HE and propose a research model entailing the impact of Co-creation on student perceived value and subsequently on Satisfaction.

The thesis includes three systematic reviews. A total of 128 (first and second Systematic literature review) and 88 (third Systematic literature review) journal articles were systematically analyzed utilizing both qualitative and quantitative approaches. A survey-based study was conducted with a sample size of 356 students and two interviews with two educators at IBA in Denmark. Structural Equation Modeling (SEM) was performed to test the proposed model. The analysis reveals several significant relationships between student co-creation behavior, perception of value, and student satisfaction. Specifically, findings support that there is a relationship between student co-creation behavior and their student perception of value within a GBL environment in HE. Additionally, findings show that student perception of value positively impacts student satisfaction with GBL in HE.

The contribution of this thesis to student satisfaction and co-creation behavior literature is fourfold. First, it focuses specifically on student perception of the value of HE and student satisfaction in HE. Second, the thesis provides a detailed and comprehensive classification of co-creation strategies in HE and their benefits for both students and HEIs. By providing a map of existing research, the study contributes to the clarification of the student co-creation model in HE and identification of research gaps, and opportunities for further research. Furthermore, it examines separately, for the first time, the effect of GBL on student's satisfaction and analyzes student perception of the value of GBL in HE. Third, it adapts and measures the influence of student co-creation behavior on their perception of the value of GBL in HE. Fourth, the current thesis considers, for the first time, the mediating role played by the student perceived values when integrating and being involved in co-creation activities in HE. Finally, based on the findings, several managerial implications are suggested for HEIs, educators and program developers.

Keywords: Game-based learning, Satisfaction, Co-creation, Co-production, Value in use, Perception of value, Students, Higher Education

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Chapter 1

Introduction

1.1. Research Justification

The current global and highly competitive climate among universities is driving their need to establish unique “student-focused” marketing strategies. Therefore, universities need to understand the variables that affect the expectations of students about the service they receive and thus be able to influence and achieve better experiences and higher student loyalty rates (Giner & Peralt Rillo, 2016). Recent developments in Higher Education (HE), such as growing competition in the university sector, budget reductions, the growth of quality standards, as well as students become more demanding and having to compete in a more competitive recruitment market, call for a re-evaluation of universities’ competitive strategies (Diaz *et al.*, 2016).

DeShields *et al.* (2005) noted that higher education institutions (HEIs) are focusing on identifying and satisfying the desires and expectations of their students. As Butt and Rehman (2010) indicate, numerous examinations have been conducted to measure student satisfaction at the university level. Different elements have been recognized that can potentially influence student satisfaction with various education services provided by the universities. Such factors incorporate student academic achievement, faculty performance, classroom environment, learning facilities and institution reputation and so on. Expanded costs and greater rivalry among institutions require adopting a market orientation strategy to differentiate their services from the competitors in the education industry, in order to attract students and increase enrollments. Drawing on a growing body of student satisfaction research, this study provides a detailed examination of the student perception of value in HE.

Extant research posits that students’ university-wide experience includes two major dimensions: core and supplementary. The core level centers around the learning experience which is formed by factors considered important for empowering students to meet their study commitments. While the supplementary factors shape students’ university experience, such as the quality of the physical environment (Parahoo *et al.*, 2013), library

facilities and educational technology (Mavondo *et al.*, 2004), university layouts (Ford *et al.*, 1999), social environment (Clemes *et al.*, 2007), and campus climate (Elliott *et al.*, 2008). In contrast to other service settings, the university experience is evolving, uncertain, and not pre-established (Ng & Forbes, 2009). One key reason supporting this point of view is that high-quality service attributes could prompt a superior student experience, which thus would create satisfaction (Elsharnouby, 2015), motivation, engagement, participation, and co-creation.

HEIs are increasingly acknowledging that HE is a service industry, and are placing greater emphasis on meeting the expectations and needs of their participating clients (students). Satisfaction will impact the student's intentions to stay at or leave the institution (DeShields *et al.*, 2005). Research consistently shows a direct correlation between student satisfaction and student retention and it has long been realized students are more likely to be retained when they are able to form connections and become effectively engaged with the campus community (Nowell, 2017).

One of the major issues confronting HE is the reduction in student engagement and participation in classes, especially the low participation in lectures (Love & Crough, 2019). Current perspectives recommend that students ought to be engaged as active co-producers of the university experience (Bowden & D'Alessandro, 2011). In the interest of heightening students' motivation, teaching methods are moving towards complex techniques including experiential learning that can unleash students' dedication to their own learning procedure. Inside this unique circumstance, the utilization of instructional games gives lecturers intelligent methods for conveying knowledge in a more relaxed and stimulating way (Gil-Doménech & Berbegal-Mirabent, 2019).

Students and HEIs have different motivating forces to improve the student experience. Institutions are motivated by their desire to find extra revenue, as government subsidies decrease and global competition grows (Dollinger *et al.*, 2018). Educational developers and educators have focused on attempting to make the student experience more engaging since engagement leads to better persistence, learning, and achievement (Bryson, 2016). Students, in the meantime, have indicated enthusiasm for playing a more active role in their HE experience as partners (Bovill *et al.*, 2016). While both HEIs and students are

motivated to improve the student experience, there are few pathways to help them do so cooperatively.

Co-creation can offer a strategic advantage of providing unique services designed by the clients (Witell *et al.*, 2011). In order to implement this viewpoint, organizations shape their channels to create strong links with partners, being active client participation and collaboration one of the essential functions (Hatch & Schultz, 2010; Ribes-Giner *et al.*, 2016). Value co-creation is an approach whereby students' resources are integrated with organizational resources to facilitate a range of activities and experiences that encourage interaction which can lead to better practices and innovation (Prahalad & Ramaswamy, 2004a). However, the application of value co-creation to HE is relatively new (Díaz-Méndez & Gummesson, 2012; Elsharnouby, 2015; Navarro-García *et al.*, 2014) and no unanimous conceptual model of co-creation in HE exists. Therefore, one of the commitments of this investigation will be to advance a value co-creation model to explore in the HE context. This study aims at linking the approach of value co-creation to the anticipated benefits that may create mutual value for institutions and students.

Educators are continuously endeavoring to discover innovative methods of engaging their students and ensuring that they accomplish the desired learning outcomes. Interest in the use of games as a teaching and learning approach (Menon & Romero, 2019) has been growing in the past years, including in HE. The disruption caused by the COVID-19 pandemic has emphasized the need for effective strategies both from a pedagogic, and social and emotional needs perspective. It is imperative not only to find adequate tools to make up for the learning loss but also to prepare for a new education paradigm combining distance learning, in-classroom learning and blended learning (Darling-Hammond & Hyler, 2020). GBL can contribute to navigating teaching and learning during the pandemic and beyond.

In this study, we focus on the connections between student co-creation behavior, student satisfaction and student perception of value of GBL in HE. Educational games show mixed impacts over various constructs, for example, student performance, engagement, and learning motivation. Yet, as these investigations focus only on certain disciplines, there remains a gap in the literature concerning a clear framework of gamification for use across

academic programs in HE. This study does not focus only on the cognitive outcomes, which are the most obvious and common topic among other scientists, it analyzes behavioral and effective impacts. Moreover, most of the previous studies focus on the effects of games on the learning process of certain subjects (e.g. Science, Business, Nursing, etc.), whereas this study expands research on a wide spectrum of HE. Gamification and GBL in HE are becoming increasingly popular. However, they very rarely examine student's perception of value of the GBL, student co-creation behavior and satisfaction. Value in education is crucial for HEI strategic planning and market orientation. Hence, comprehending, managing, and impacting student perception of value is key for both students and HEIs.

This thesis aims to analyze and critically discuss the relationship between student satisfaction, student perception of value and co-creation behavior in GBL in HE through the following research question and objectives.

1.2. **Research Problem and Objectives**

According to the review's background of the topic, this study focuses on the research questions and objectives below:

1.2.1. General Research questions

What is the relationship between student co-creation behavior, student perception of value and student satisfaction in GBL in HE?

Specific Research questions

- (1) What is the relationship between student co-creation behavior and student satisfaction in GBL in HE?
- (2) What are the factors that contribute to student satisfaction in GBL in HE?

1.2.2. Research objectives

From the aforementioned questions, the following general research objectives were proposed:

- (1) Understand and critically discuss the antecedents of student satisfaction with HE.
- (2) Critically discuss the GBL methods in HE.
- (3) Critically discuss the student perception of value in HE.
- (4) Critically discuss the student co-creation in HE.
- (5) Critically discuss the student co-creation strategies and approaches, benefits and barriers in HE co-creation.
- (6) Critically discuss the student roles and behaviors in HE co-creation.

- (7) Critically discuss the relationship between student co-creation behavior in GBL environment, student perception of value of GBL and student satisfaction with GBL.

In order to obtain these objectives, we conducted three systematic literature reviews and two empirical studies, one qualitative and one quantitative. In the first stage, interviews were conducted with International Business school's lecturers and second, an online survey was conducted among students. Table 1.1 demonstrates the distribution of research questions and objectives over the three systematic literature reviews and two empirical studies.

	Chapter 2	Chapter 2	Chapter 2	Chapter 2	Chapter 2	Chapter 3
Section	Section1	Section2	Section3	Section4	Section5	
Title	Student Satisfaction	Game based Learning as an Innovative Learning and Teaching Method	Student Perception of Value in Higher Education- A Systematic Literature Review	Student Co-Creation in Higher Education – A Systematic Literature Review	Students roles and behaviors in Higher Education co-creation - A Systematic Literature Review	Theoretical Model and Hypotheses
Research questions	#1	#1	#1 & #2	#3	#3	#general question
Research objectives	#1	#2	#1 & #3	#4	#5	#7
Main variables	Student satisfaction		Student perception of value	Student Co-creation	Student Co-creation	Student satisfaction, perception of value and co-creation behavior

Table 1.1. Distribution of research questions and objectives over systematic literature reviews and empirical research

Source: own elaboration

1.3. Research contribution

Usefulness, significance, or substantive contribution is a vital evaluative rule of scientific research. Research is expected to advance knowledge in a given area and result in improved living conditions. Research ought to illuminate, educate, transform, or emancipate. There needs to be upfront and continuous questioning of the 'so what' or utility of our work. Does our work have any kind of effect, and if so for whom, and how and why? (Leavy, 2017).

The subject of this examination is to analyze student perception of value, satisfaction and co-creation behavior in a GBL environment in HE. The exploration will help the administrators of the universities and the policymakers to focus on these elements that

impact on satisfying students as well as on co-creation behavior. And to find an effective strategy to motivate students to co-create. This will contribute to a superior service quality provided by the universities, and thus, will help not only to retain the current students but also to gain new ones (Yi & Gong, 2013).

Previous research has demonstrated that different factors affect student satisfaction in HE. However, there is a scarcity of research on variables that lead to greater mastery and understanding of what affects the expectations of students about the service they receive from HEIs. As indicated by the service-dominant logic, value resides not in the product (whether goods, services or experiences, or any offering capable of satisfying a consumer need), but also in the service that the product delivers to the client, for example, products do not hold value for a client until or unless they can be utilized. Along these lines, value arises through use or consumption and the emphasis shifts from the provider to the consumer (Ledden *et al.*, 2011). The thesis focuses on the student perception of value of GBL in HE and, hence, concentrates on student co-creation, which in turn impacts student satisfaction. Specifically, the relationship between student perception of value and their co-creation behavior in a GBL environment in HE and its impact on student satisfaction and academic performance are investigated.

The general contribution of this study lies in understanding the role of GBL as an innovative teaching method in influencing the student perception of value (expectation), satisfaction and their co-creation behavior in HE. This will help develop HE marketing and strategy knowledge, specifically in which refers to student satisfaction and co-creation in a low motivating environment.

According to the chosen research methodology, including both systematic literature reviews and qualitative and quantitative methods, this study aims to map the studied topics in detail leading to proposing a testing of a conceptual model. In addition, Boeije *et al.* (2013) mentioned that this forces the scientists to be clear about the subjects that they have analyzed and to efficiently list the quantitative discoveries for comparison. For complementary investigations, the challenge seems to be to explicitly define what each of the components adds to the knowledge. An essential part of confirmatory examinations is to consider, which diverse strategies are currently being developed. This methodology has

the impact of turning research 'projects' into research 'programs' since it animates increasingly modern and complex investigations.

The findings of our thesis support the significant and different student co-creation strategy and their roles and behavior. Also, present the student perception of value and its antecedents. The present research, therefore, makes contributions to the literature on student satisfaction, student perception of value, and student co-creation behavior in HE. The thesis has filled diverse gaps linking to each of the studied variables as is further discussed in each study.

Below, further contributions of this study are discussed.

1.3.1. At the level of student perception of value of HE experience

The first systematic literature review in this thesis focuses on the student perception of value in HE. The findings of section (3) indicate that the main student perception of value dimensions in HE is functional, social, epistemic, emotional and, conditions. Although there are some factors that impact students' value judgments such as university image, quality of services, student demography and culture, the valence of students' experience, trust, student personal characteristics and personal value, and risk. Moreover, our analysis uncovered a number of students' perception of value consequences. These findings help us to provide different recommendations to HEIs on how they can impact students' perception of value and expectation and enhance satisfaction as students perception of value has an impact on their satisfaction and loyalty, intention to offer positive or negative word-of-mouth recommendations.

1.3.2. At the student co-creation level

At the level of student co-creation, previous research has yielded mixed findings on the importance and the way this factor influences the education system. This thesis inventories and categorizes different co-creation strategies and platforms HEIs applied for students to co-create their HE experience. Additionally, the analysis in the second systematic literature review (section 4) identified motivational and educational benefits for students and pedagogical and competitive benefits for HEIs. The provided results are deemed as the

most comprehensive since in addition to recreational facilities and activities that appeared previously in the literature, it encompasses co-creation antecedents identified. Moreover, section 4 addresses, for the first time, the mapping of the co-creation strategies in HE.

This thesis analyzes and critically discusses the state of the art of student co-creation roles in HE and the approaches HEIs use to involve students to co-create. By providing a map of existing research, the study contributes to the clarification of the student co-creation model in HE and identification of research gaps, and opportunities for further research. The third systematic literature review (section 5) clarifies the co-creation process and approaches in HE that have been used by HEIs. Moreover, the findings provide a map of the co-creation roles that students are playing and their co-creation behavior. This thesis provides a map of students' co-creation approaches in HE.

1.3.3. At the level of satisfaction with Game-based learning environment

Past research has made well-recognized contributions toward the study of the gamification of education and GBLE environment. However, few empirical studies have investigated how the GBLE method affects engagement, co-creation, and satisfaction. Sections 1 and 2 contribute to present preliminary results and the underlying idea of the activity, as well as the encouraging results, gained to inspire lecturers to implement GBLE activities in their courses. Moreover, the study adds to the research by specifically using GBLE as an innovative learning method during the COVID-19 pandemic and beyond. Game categories, characteristics, and measurements in education, and the effectiveness of GBLE on the education system are presented in section 2. The findings of these sections and study demonstrate how GBLE influences students' satisfaction level and their co-creation behavior as well as understanding student perception of the value of GBLE in HE. These findings enable us to provide HEIs managers with a set of recommendations regarding leveraging the GBLE to enhance the HE experience.

It is worth mentioning, that the sections also provide a broad discussion regarding a new study path between student desire to co-create and their perception of value in GBLE in HE. This path had not been studied before in the literature, and having a better understanding of it enhanced the theoretical and practical contribution of this thesis.

1.4. Thesis Structure

This thesis consists of six chapters. The first chapter is an overall introduction where research justification, research problems and objectives and research contribution are explained. The second chapter presents the relevant literature for this study and encompasses five sections. The first section focuses on clarifying the concept of student satisfaction in HE and its different antecedents. In section 2, we introduce the GBL as an innovative learning and teaching method. In this section, the characteristics and impacts of gamification on the education system are presented.

Sections 3, 4 and 5 are systematic literature reviews. Section 3, “Student Perception of Value in Higher Education- A Systematic Literature Review”, focuses on the questions regarding student satisfaction and perception of value elements in higher education. Section 4 presents “Student Co-Creation in Higher Education – A Systematic Literature Review”. This systematic literature review enfolds the strategies and platforms used by HEIs to make students co-create in their own HE experience. This study categorizes the barriers and benefits of co-creation in HE for both students and HEIs. In Section 5 we investigate the co-creation process in HE and student co-creation roles and behavior; “Students roles and Behavior in Higher Education Co-creation -A Systematic Literature Review”.

Chapter 3 presents the model and hypotheses. Chapter 4 reports the research method and design. Specifically, the philosophical aspects of the research, methodology, research methods including research design and strategy, survey design and data analysis procedures are presented. Data Analyses are presented in chapter 5.

In chapter 6- we present and discuss the findings of the study which answer the research questions. We also discuss the overall contributions to theory and practice. Finally, we conclude (chapter 7) by discussing the main limitations, and by offering several directions for future research. Based on the preceding, we provide Table 1.2 which illuminates the structure of our thesis.

Title	
Abstract	
Chapter 1	
Introduction	Research justification
	Research problem and objectives
	Research contribution
	Thesis structure
Chapter 2	
Literature Review	Section 1 - Student Satisfaction Antecedents in Higher Education
	Section 2 - Game-based Learning as an Innovative Learning and Teaching Method
	Section 3 - Student Perception of Value in Higher Education- A Systematic Literature Review
	Section 4 - Student Co-Creation in Higher Education – A Systematic Literature Review
	Section 5 - Students roles and behaviors in Higher Education co-creation -A Systematic Literature Review
Chapter 3	
Theoretical model and hypotheses	Theoretical model
	Hypotheses
Chapter 4	
Methodology	The philosophical aspects of research
	Qualitative research design
	Quantitative research design
Chapter 5	
Data Analysis	Qualitative Data Analysis
	Quantitative Data Analysis
Chapter 6	
Discussion	Research questions
	Hypotheses
Chapter 7	
General Conclusion and implications	Conclusion
	Implications
	Limitation and future lines of research
References	
Appendix	

Table 1.2. Thesis structure

Source: own elaboration

Chapter 2 Literature review

Section 1. Student Satisfaction

Abstract

The strategic and economic importance of research on satisfaction in HE has attracted academic- and management-related attention. Student satisfaction with university experience is elusive to catch. Unlike other service settings, the university experience is developing, uncertain, and not pre-established. In this section, we categorize the main dimensions of students' university experience and antecedents of student satisfaction.

2.1.1. Introduction

The strategic and economic importance of investigations of satisfaction in HE has attracted policymakers attention (Santini *et al.*, 2017). In recent decades, analysts have endeavored to outline satisfaction construct after recognizing the need to monitor student satisfaction as a method of assessing the general performance of HEIs (Martirosyan, 2015; Wilkins & Balakrishnan, 2013).

University student satisfaction is characterized as 'a short-term attitude resulting from an evaluation of a student's educational experience' (Elsharnouby, 2015, p.241). Farooqi (2017) considers customer satisfaction, in line with Oliver (1997,1980), as a judgment that a product or service highlight, or the product or service itself, gives a pleasurable level of utilization-related fulfillment, including degrees of under or over satisfaction. Moreover, consumer satisfaction will prompt organizations to enhance their reputation and image, decrease client defection, and enhance attention towards the client's needs. Besides, fulfillment is normally estimated as a subjective procedure in which clients analyze their earlier expectations regarding the organization with the organization's real execution (Elsharnouby, 2015). Additionally, Kaur and Kiran (2015) argue that a satisfied customer constantly shares his or her encounters with others through word of mouth contributing to an increase in the number of clients. On the other hand, a dissatisfied client can have the opposite effect and lead to losing present and prospective clients.

2.1.2. Student Satisfaction

Satisfaction is a construct that identifies with the assessment of perceived discrepancies between expectations for a product and the performance of the product after consumption (Oliver, 1980). According to Oliver (1980), when the actual performance of a particular product or service does meet the customer's expectations, negative disconfirmation will occur and prompt the customer's disappointment while positive disconfirmation happens whenever execution of a specific item or service surpasses customer's expectation, and will incite consumer satisfaction. When there is not any gap between customer's expectation and perceived the execution of a specific item or service, perceived performance is equivalent with expectation and simple confirmation occurs (Elkhani & Bakri, 2012). Parasuraman *et al.* (1990) clarified satisfaction as the difference between service performance as perceived by the client and what the client expects. It is also characterized as the consumer's overall assessment of the utility of a product (or service) based on perceptions of what is received and what is given. Giese and Cote (2000) contend that fulfillment is an enthusiastic or cognitive response relating to a specific focus (expectations, product, consumption experience) that happens at a particular time (after/during consumption, after choice, based on accumulated experience) (Elsharnouby, 2015).

Student satisfaction with university experience is elusive to catch. Unlike other service settings, the university experience is developing, uncertain, and not pre-established. Hence, evaluating the quality of this experience is complex due to the dynamic nature of students' expectations and the lack of consensus concerning which aspects of the university-wide experience are relevant for students. Being heterogeneous in nature, students would differ in what they value within the university experience (Ng & Forbes, 2009; Elsharnouby, 2015).

2.1.3. Antecedents of Student Satisfaction in HE

Student fulfillment with the university experience is a complex and multifaceted phenomenon and there is no consensus concerning how to approach, conceptualize and measure it. The university experience in itself is complex, and there has been less effort in the literature to 'capture the varied aspects of the university experience into a unifying framework that brings in salient issues in education (Ng & Forbes, 2009, p.46). Moreover, Elkhani and Bakri (2012) note that, according to the Disconfirmation theory, satisfaction is related to the course of the disconfirmation experience

that happens as a consequence of comparing service performance against expectations.

Hence, assessing the quality of this experience is complex because of the dynamic nature of students' expectations and the lack of consensus concerning which aspects of the university-wide experience are relevant for students. Being heterogeneous in nature, students are likely to vary in what they expect out of the college experience (Ng & Forbes, 2009). Specialists have further contended that determining the appropriate point in time to measure satisfaction is a challenge, as fulfillment can vary considerably over time and is only determined when the assessment happens. A typical approach to measuring student satisfaction in HE literature is to identify the appropriate items for assessing service quality attributes (Elsharnouby, 2015).

As Butt and Rehman (2010) indicate, numerous examinations have been conducted to measure student satisfaction at the university level. Different elements have been recognized that can potentially influence student satisfaction with various education services provided by the universities. According to Butt and Rehman (2010), such factors incorporate student academic achievement, faculty performance, classroom environment, learning facilities and institution reputation, and so on.

2.1.3.1. Student University Experience

Extant research posits that students' university-wide experience includes two dimensions: supplementary and core. The supplementary factors shape students' university experience, such as the quality of the physical environment (Parahoo *et al.*, 2013), library facilities and educational technology (Mavondo *et al.*, 2004), university layouts (Ford *et al.*, 1999), social environment (Clemes *et al.*, 2007), and campus climate (Elliott *et al.*, 2008). The core level centers around the learning experience, which is formed by factors considered important for empowering students to meet their study commitments. The key reason supporting this point of view is that high-quality service attributes could prompt a superior student experience, which thus would create satisfaction (Elsharnouby, 2015), motivation, engagement, participation, and co-creation.

2.1.3.2. Antecedents of Supplementary Student Experience Satisfaction

The growing competitiveness in student recruitment among HEIs has created a need for assessing the viability of academic programs and student support services. It has been documented in past research that various variables influence student satisfaction in a university environment. As indicated by Martirosyan (2015), these variables are quality of programs, instructional effectiveness, student support facilities, internet and library access, administrative staff efficiency, and individual demographic characteristics such as gender, ethnicity, and age.

Santini *et al.* (2017) describe a systematic review and meta-analysis that identified key antecedent and consequent constructs of satisfaction in HE and service quality perception. They examined 413 studies investigating the satisfaction construct in HE and identify a number of factors that have a relationship with student satisfaction, such as: commitment (Teo & Soutar, 2012) "Willingness to maintain a long-term relationship with the HEI due to its good image" (Santini *et al.*, 2017, p.17), general expectation "General expectations of students regarding the HEI" (Santini *et al.*, 2017, p.17), image (Ledden & Kalafatis, 2010) "Cognitive, affective, tangible and intangible perception that composes the image of the HEI" (Santini *et al.*, 2017, p.17), recognition (Martirosyan, 2015) "Positive repercussions in relation to the image of the HEI" (Santini *et al.*, 2017, p.17), reputation (Fagerstrøm & Ghinea, 2013) "An approximate measure of the degree of society's trust in and the credibility of the HEI" (Santini *et al.*, 2017, p.17) and responsiveness (Hasan *et al.*, 2009) "Recognition of the HEI's proactive ability to help students" (Santini *et al.*, 2017, p.17). They additionally mention that marketing orientation items affect student satisfaction, such as brand orientation (Sultan & Wong, 2014) "Brand management of the HEI with the objective of achieving competitive advantage" (Santini *et al.*, 2017, p.17), management systems (Marzo-Navarro *et al.*, 2005) "Establishment of management system oriented to the improvement of processes" (Santini *et al.*, 2017, p.17) and outcomes (Duque, 2013) "Description of tangible results obtained by the HEI" (Santini *et al.*, 2017, p.17).

In the same study, Santini *et al.* (2017) identify a detailed list of factors that impact student fulfillment, namely: perceived value in educational services, for example, assurance (Usman, 2010) "Responsibility to deliver what has been promised to clients, meeting expectations" (Santini *et al.*, 2017, p.16), cognitive control (Duque, 2013) (Perception of control is associated with the perception that the student can impact the HEI and different aspects of it), empathy (Nell & Cant,

2014) (Alludes to the perception of care and care given by the teaching institution to students), hedonic value (Teo & Soutar, 2012) "Perception of pleasure and fantasies evoked by the higher education organization" (Santini *et al.*, 2017, p.16) , monetary value (Ledden & Kalafatis, 2010) (Perception of expense related with the HEI), reliability (Usman, 2010) (Ability to perform the promised service precisely and reliably), social value (Durvasula *et al.*, 2011) "Social integration provided by the university environment." (Santini *et al.*, 2017, p.16), universalism value (Hanssen & Solvoll, 2015) "Perception of universal value of the higher education institution" (Santini *et al.*, 2017, p.16), and utilitarian value (Sun *et al.*, 2008) "Perception of the functional attributes of the HE organization" (Santini *et al.* 2017, p.16).

Finally, according to Santini *et al.* (2017), student satisfaction is influenced by resources provided to the student in HE such as assessment and feedbacks (Lai *et al.*, 2015) (Relationship between student and teacher with respect to the assessment and follow-up of work and different activities), access to technology (Wilkins & Balakrishnan, 2013) "Availability of technological resources in the classroom and in the university environment" (Santini *et al.*, 2017, p.16), course flexibility (Ali *et al.*, 2016) "Flexibility in terms of schedules, locations and forms of class participation" (Santini *et al.*, 2017, p.16), curriculum (Liu, 2012) (Structure of existing disciplines in the HEI.), employability in the labor market (Marzo-Navarro *et al.*, 2005) "Student's perspective of employment during his/her time in the HEI" (Santini *et al.*, 2017, p.16), general tangibility (Nell & Cant, 2014) "Physical appearance and equipment properties" (Santini *et al.*, 2017, p.16), professors (Carter, 2009) "Evaluation of the university's teaching staff in relation to experience, curriculum and didactics.", knowledge co-creation" (Santini *et al.*, 2017, p.16), library service (Stukalina, 2014) "Services provided by the university library in relation to books, attendance and schedules" (Santini *et al.*, 2017, p.16), presentation of information (Hemsley-Brown *et al.*, 2010) "Information made available to students in the HEI" (Santini *et al.*, 2017, p.16), skills developed (Lai *et al.*, 2015) "Skills developed by studies from the lessons learned" (Santini *et al.*, 2017, p.16), support (Hemsley-Brown *et al.*, 2010) "Support resource for the development of HEI activities" (Santini *et al.*, 2017, p.16), teaching method (Stukalina, 2014) "Skills and abilities to pass on the content of student learning" (Santini *et al.*, 2017, p.16) influence. Furthermore, they assert service quality perception for instance.

Napoli and Wortman (1998) assessed that psychological measures such as life events during university, self-esteem, social competence, social support, personal conscientiousness, psychological well-being and fulfillment with the academic, administrative and social systems of the university have an influence on university persistence (Butt & Rehman, 2010). In this perspective, Elsharnouby (2015) takes four key antecedents proposed by Parahoo *et al.* (2013) to analyze student satisfaction with university experience: (a) perceived university reputation, (b) perceived faculty competency, (c) quality of interactions with administrative/IT staff, and (d) interactions with other students (Elsharnouby, 2015).

(a) Perceived university reputation: The image of a university is developed in students' minds through two sources: the outside community and their personal experiences within the university (Clemes *et al.*, 2007).

(b) Role of faculty: Students' perception of faculty is vital to the degree that some may argue that for some students, particularly freshmen, the instructor is the institution (Vander Schee, 2011). Voss *et al.*, (2007) perceive that faculty is the key determinant of students' perceptions of service quality and that the faculty's ability to adapt conduct to their students' underlying expectations would positively affect students' perceived service quality and their levels of satisfaction. Students as clients of a service organization operating in education expect to be personally improved and intellectually developed by the lecturers. The ultimate benefit students search for from competent faculty is 'valuable learning experience', which is considered as a means toward acquiring skills and knowledge and, ultimately, an important step for their profession. Different specialists argue that students' classroom experience in terms of quality of lecturer/ classroom delivery is the most essential factor for students' perception of education quality (Elsharnouby, 2015).

(c) Student-administrative/IT interaction: In an innovation empowered learning environment universities need to embrace approaches that balance offering high technology solutions and high-quality human interactions. Numerous universities are presently adopting online learning platforms through which students can register, access course materials, interact with their instructors, submit assignments, and get their evaluations. Thus, it is believed that IT facilities

are now a 'must-have' requirement in HE. However, these aspects of university experience require experienced IT staff to support students who experience technical difficulties (Elsharnouby, 2015).

- (d) Student–student interaction: It goes beyond the classroom setting to incorporate different associations in the campus environment. The level of social integration with other students appears to be particularly vital to students in large institutions. Aspects of student-student interaction, for example, opportunities to socialize and engage in enjoyable experiences with peers (Gibson, 2010), as well as introducing students to the social life of the campus (Vander Schee, 2011), have been shown as significant predictors of satisfaction (Elsharnouby, 2015).

2.1.3.3. Student satisfaction antecedents of core experience

In the development of the core service, academic-student interaction is often a significant part of the satisfaction. Service specialists have indicated interactions through the use of role theory (Solomon *et al.*, 1985), script theory, ritualizing (Nikolich & Sparks, 1995), or applying a theatrical approach. Sierra and McQuitty (2005) found that when there is close interaction between a service employee and a client, the process of service delivery (how it is performed) is often more significant than what was delivered. Educational researchers acknowledge that the learning experience is not one that is divorced from its environment but is intricately linked and dependent upon it. Similarly, the result of the interaction is not the main factor for satisfaction (a student may not do well in a subject but was inspired by and happy with the way the subject was taught).

As indicated by the Self-Determination Theory (Deci & Ryan, 1985), inspirations can be intrinsic or extrinsic. The former entails doing something since it is inherently interesting or enjoyable, while the latter is effective only when the desired result is achieved. According to Nowell (2017), if a student is motivated to work hard in a particular task by the expectation of improving his/her evaluations, as soon as that goal is reached there is no longer an inspiration to work hard. Intrinsically motivated students are not only able to develop a deeper approach to learning, but also show diminished anxiety, improved daily well-being and enhanced academic performance. Especially, it describes a mediation to promote students' attention in class and encourage their independent study habits (Berbegal-Mirabent *et al.*, 2020). It is significant to innovate in current teaching training at HE in

order to improve students' involvement, perception, collaboration and motivation (Gil-Doménech & Berbegal-Mirabent, 2019).

Universities do have some control over the environment. Rather than seeing facilities and accommodation as a simple support for learning activities, they can be designed to support socialization and create a more pleasant environment. The design of such a physical facility in which the service is performed, delivered, and consumed can potentially make a huge difference to a student's university experience (Ng & Forbes, 2009).

Satisfaction with the learning process can be characterized as an effective learning result that focuses on improving the level to which the learner is immersed in the subject (Gupta & Bostrom, 2009, p. 692). Satisfaction with the learning process can be portrayed as the positive feelings of learners related to their performance and related to effective results of learning (Gupta *et al.*, 2010). In a classroom setting, this sort of feeling is typically triggered by an educator who can support learners in improving their performance since satisfaction is higher when clients believe the learning and teaching system they use meets their information requirements (Eom, 2014; Schöbel *et al.*, 2020). This feeling of being satisfied with the learning process can be accomplished by informing learners how well they have performed and by interacting with them.

Reference	Causes of Student satisfaction in HE
<i>(Martirosyan, 2015)</i>	Quality of programs
	Instructional effectiveness
	Student support facilities
	Internet and library access
	Administrative staff efficiency
<i>(Santini et al., 2017; Teo & Soutar, 2012)</i>	Individual demographic characteristics such as gender, ethnicity, and age
	Commitment
	General expectation
	Image
	Identity of HEI
	Recognition
<i>(Santini et al., 2017; Wilkins & Balakrishnan, 2013; Zopiatis, Theodosiou, & Constanti, 2014)</i>	Reputation
	Responsiveness
<i>(Santini et al., 2017; Ali et al., 2016)</i>	
<i>(Santini et al., 2017; Nell & Cant, 2014)</i>	
<i>(Santini et al., 2017; Casidy, 2013, 2014)</i>	Marketing
	Brand Orientation

<i>(Santini et al., 2017; Chen, 2011)</i>	orientation	Management Systems	
<i>(Santini et al., 2017; Duque, 2013)</i>		Outcomes	
<i>(Santini et al., 2017; Moosmayer & Siems, 2012; Nell & Cant, 2014)</i> <i>(Santini et al., 2017; Martirosyan, 2015)</i>		Assurance Cognitive Control	
<i>(Santini et al., 2017; Usman, 2010; Nell & Cant, 2014)</i>	Perceived value in educational services	Empathy	
<i>(Santini et al., 2017; Duque, 2013)</i>		Hedonic Value	
<i>(Santini et al., 2017; Ledden & Kalafatis, 2010; Chen, 2011)</i>		Monetary Value	
<i>(Santini et al., 2017; Incesu & Asikgil, 2012; Nell & Cant, 2014)</i>		Reliability	
<i>(Santini et al., 2017; Durvasula et al., 2011)</i>		Social value	
<i>(Santini et al., 2017; Moosmayer & Siems, 2012)</i>		Universalism Value	
<i>(Santini et al., 2017; Ledden & Kalafatis, 2010; Teo & Soutar, 2012)</i>		Utilitarian Value	
<i>(Santini et al., 2017; Wilkins & Balakrishnan, 2013)</i>		Assessment and Feedbacks	
<i>(Santini et al., 2017; Sun et al., 2008; Wilkins and Balakrishnan, 2013)</i>		Access to Technology	
<i>(Santini et al., 2017); (P. C. Sun et al., 2008)</i>		Course Flexibility	
<i>(Santini et al., 2017; Wilkins & Balakrishnan, 2013; Martirosyan, 2015)</i>	Resources provided to the student	Curriculum	
<i>(Santini et al., 2017; Zopiatis et al., 2014; Hanssen & Solvoll, 2015)</i>		Employability in The Labor Market	
<i>(Santini et al., 2017; Usman, 2010; Incesu & Asikgil, 2012)</i>		General Tangibility	
<i>(Santini et al., 2017)</i>		Professors	
<i>(Santini et al., 2017; Duque, 2013)</i>		Knowledge Co-creation	
<i>(Santini et al., 2017; Stukalina, 2014; Mavondo et al., 2004; Munteanu, Ceobanu, Bobălcă, & Anton, 2010)</i>		Library Service	
<i>(Santini et al., 2017; Incesu & Asikgil, 2012)</i>		Presentation of Information	
<i>(Santini et al., 2017; Lai et al., 2015)</i>		Skills Developed	
<i>(Santini et al., 2017)</i>		Support	
<i>(Santini et al., 2017; Das and Haque 2013; Mavondo et al., 2004)</i>		Teaching Method Influence	
<i>(Santini et al., 2017; Sultan & Wong, 2014; Duque, 2013)</i>	Service quality perception	Academic Service Quality	
<i>(Santini et al., 2017; Sultan & Wong, 2014; Duque, 2013)</i>		Administrative Service Quality	
<i>(Santini et al., 2017; O'Driscoll, 2012; Sultan & Wong, 2014; Mavondo et al., 2004)</i>		Facilities Service Quality	
<i>(Santini et al., 2017; Martirosyan, 2015)</i>		Professor Quality	
<i>(Santini et al., 2017; Carter, 2009; Athiyaman, 1997)</i>		Support Service Quality	
<i>(Santini et al., 2017; Das and Haque, 2013; Mavondo et al., 2004)</i>		Teaching Service Quality	
<i>(Santini et al., 2017; Usman, 2010)</i>		Total Service Quality	
<i>(Santini et al., 2017; DeShields et al., 2005; Kara & DeShields, 2004)</i>		Advising Staff	
<i>(Santini et al., 2017; Hemsley-Brown et al., 2010)</i>		University environment	Atmosphere Among Students
<i>(Santini et al., 2017; Zavareh et al., 2012)</i>			Campus Life
<i>(Santini et al., 2017; Hopland & Nyhus, 2015; Mavondo et al., 2004)</i>	Classroom Environment		

<i>(Napoli & Wortman, 1998; Butt & Rehman, 2010)</i>	Psychological measures (life events during university, self-esteem, social competence, social support, personal conscientiousness, psychological well-being and fulfillment with the academic, administrative and social systems of university)
<i>(Kay, MacDonald, & DiGiuseppe, 2019)</i>	Learning characteristics (clarity, flexibility, opportunities for application, timely guidance and feedback, and cognitive engagement)
<i>(Alwi & Ismail, 2013; Clemes et al., 2007; Elsharnouby, 2015; Parahoo et al., 2013; Sadiq Sohail & Shaikh, 2004)</i>	Perceived university reputation
<i>(Elsharnouby, 2015; Mavondo et al., 2004; Parahoo et al., 2013; Vander Schee, 2011; Voss et al., 2007)</i>	Perceived faculty competency
<i>(Elsharnouby, 2015; Gibson, 2010; Mai, 2005; Mavondo et al., 2004; Parahoo et al., 2013)</i>	Quality of interactions with administrative/IT staff
<i>(Elsharnouby, 2015; Gibson, 2010; Mittler, 2002; Parahoo et al., 2013; Vander Schee, 2011)</i>	Interactions with other students

Table 2.1.1. Causes of student`s satisfaction in HE(self-created)

Source: own elaboration

2.1.4. Conclusion

The universities services industry is changing quickly. Innovation, government regulation and deregulation, and expanding student's advancement are driving HEIs to reconsider their present business practices in light of a changing and competitive business condition. As indicated in the literature, students' university experience incorporates two dimensions of supplementary and core experience. Our study identified different elements that cause student satisfaction in HE such as, the elements related to the university brand, environment and strategies such as the identity of HEIs and marketing orientation; the elements related to the service and resources provided to students; student perception of value and service quality, student demography; and, psychological measures.

Section 2. Game-based learning as an Innovative Learning and Teaching Method

Abstract

Internationally, educators are endeavoring to discover innovative methods of engaging their students and ensuring that they accomplish the desired learning outcomes. This section introduces games, gamification and game-based learning (GBL) and provides a literature review on their possible benefits and limitations in education. Games mechanics and learning mechanics that empower these games to be conceivably playful activities for teaching and learning will be discussed. This chapter provides educators and scientists with the required information supported by different investigations to consider the integration of educational games with their current learning methods.

2.2.1. Introduction

New generations of students learn in unique styles (Prensky, 2014), preferring to study material that is useful, enjoyable, and relevant. It is become a new educational challenge to figure out how this generation can learn more effectively and what their preferred learning methods are. The education industry has had to be reinvented and altered to meet the demands, preferences, and orientations of digital natives, to be successful in the 21st century. Moreover, the lack of motivation of students to learn (Lee & Hammer, 2011) became a fundamental problem in modern education (Garcia-Iruela & Hijon-Neira, 2020).

Interest in the use of games as a teaching and learning approach (Menon & Romero, 2019) has been growing in the past years, including in HE. It is imperative not only to find adequate tools to the makeup for the learning loss but also to prepare for a new education paradigm combining distance learning, in-classroom learning and blended learning (Darling-Hammond & Hylar, 2020). Game-based Learning (GBL) can contribute to navigating teaching and learning.

Research reflecting on the effectiveness of games in education is broad. GBL is viewed as a potential method for increasing students' confidence and enhancing their motivation by incorporating challenge, curiosity and fantasy into a particular issue (Garris *et al.*, 2002). Improving networking

skills, maintaining collaborative relationships with individuals, and making decisions as a team is considered critical skills to be successful in the novel age (Lee *et al.*, 2015). Previous studies analyze the extent to which social skills like commitment, communication and teamwork are gained by students and teachers. These collaboration skills have been considered a significant learning outcome. GBL provides an avenue to dynamic learning and offers students the chance to apply what they learn in an enjoyable, stress-free environment (Menon & Romero, 2019).

According to Garris *et al.* (2002), students will be self-motivated and guided when they find the learning activity engaging in itself and the outcome worth striving for. Previous examinations assume that the gamification of teaching is a critical direction to follow, permitting students to become the focal point of their learning journey while expanding their inspiration and active participation. Gil-Doménech and Berbegal-Mirabent (2019) show how dynamic learning methods can boost students' intrinsic inspiration in a low-motivated environment (Beregal-Mirabent *et al.*, 2020).

2.2.2. Concept of game-based learning

Gamification is characterized as the utilization of games or activities in a non-playful environment (Yildirim, 2017). The term "gamification" appears to have been created in 2002 by Nick Pelling, with the first recorded appearance in 2008. However, the term did not gain extensive recognition until 2010 (Panis *et al.*, 2020; Deterding *et al.*, 2011). The diversification of games has been enlarged by the general utilization of the internet in every life aspect. Therefore, it is reasonable to take advantage of the elements of games and present them in the learning context. Scholarly articles reflecting on the effectiveness of games in education are broad. The majority of them focus on digital educational games (Yildirim, 2017) and their application is wide, especially in business, corporate management, or marketing-related disciplines (Beregal-Mirabent *et al.*, 2020). GBL is viewed as a potential method for increasing students' confidence and enhancing their motivation by incorporating challenge, curiosity and fantasy into a particular issue (Garris *et al.*, 2002). Moreover, extrinsic rewards can positively shape student co-creation behavior. In this setting, players can collaborate in several ways by competing with other players or teams, with the system or with themselves (Gil-Doménech & Berbegal-Mirabent, 2019).

2.2.3. Educational Game Characteristics

A game is an immersive, intentional and enjoyable activity in which a challenging goal is pursued according to agreed-upon rules. Given the applied and dynamic nature, instructional games lead to greater cognitive, skill-based, and attitudinal gains. However, games are instructional sound only if they are designed to support specific learning goals and are included logically in the syllabus (Hays, 2005). In this respect, the lecturer has to devote time and effort to effectively adjust a pleasant activity with the knowledge to be transmitted (Gil-Doménech & Berbegal-Mirabent, 2019).

There are critical voices asserting that games are just a corresponding strategy to help learning objectives. It is accordingly critical to design such activities while considering the desires and inspirations of students, in order to fulfill their ultimate purpose to become a learning instrument. Mirvis and Csikszentmihalyi (1991) identify the primary factors that make an activity playful and useful: i) it must be a challenge that requires the utilization of individual skills and the gained knowledge; ii) the targets must be clear and must provide feedback; iii) it is important to adapt it and improve it over time. Burguillo (2010) includes that activities conducted in class should incorporate a competitive component to further engage students with the activity, support the management of the class, improve the environment and reduce learning times (Beregal-Mirabent *et al.*, 2020). Researchers suggest that serious games ought to be structured by coordinating a gaming activity with a learning activity utilizing an instructional design approach. To deliver the desired learning outcomes, educators need to design genuine games considering the background, environment, and experience of students and offer them gaming experiences that they can relate to and feel motivated by (Menon & Romero, 2019). There are six key measurements that describe games: fantasy, rules/goals, sensory stimuli, challenge, mystery, and control (Garris *et al.*, 2002).

Fantasy: Games represent an activity that is separate from real life in that there is no activity outside the game that truly relates. Games include imaginary worlds; activity inside these worlds have no effect on the real-world; and when involved in a game, nothing outside the game is relevant.

Rules/Goals: In a game, the rules and requirements of the standard life are temporarily suspended and replaced by a set of rules that are operative within the fixed space and time of the game. One of the strongest findings in the literature on motivation is that clear, specific, and difficult goals lead

to enhanced execution.

Sensory stimuli: This imaginary world disrupts the stability of normal sensations and perceptions and permits the client to encounter a distortion of perception that is not readily experienced in the real world (Garris *et al.*, 2002).

Challenge: Goals ought to be clearly determined, yet the possibility of obtaining that goal should be uncertain. Games should utilize progressive difficulty levels, multiple goals, and a certain amount of informational ambiguity to guarantee an uncertain outcome (Garris *et al.*, 2002).

Mystery: curiosity is one of the essential factors that drive learning. Earlier researchers described two sorts of curiosity: (a) sensory curiosity, the interest evoked by novel sensations; and (b) cognitive curiosity, which is a desire for knowledge. Research suggests that mystery is enhanced by the incongruity of information, complexity, novelty, surprise and violation of expectations, incompatibility between ideas and failure to predict the future, and information that is incomplete or conflicting (Garris *et al.*, 2002).

Control: Control alludes to the activity of authority or the ability to manage, direct, or command something. They found that providing student controlled to expanded motivation and greater learning. Games inspire a feeling of personal control when students are allowed to select strategies, manage the direction of activity, and make decisions that directly influence outcomes (Garris *et al.*, 2002).

2.2.4. Educational Games categories

Adams (2014) utilizes existing classification methods for games. Adams' interpretation of a game world as an artificial place where a game event happens implies two classifications for educational games: (a) game worlds that stimulate and sustain students' participation and motivation and that provide freedom of navigation (Chen *et al.*, 2012) and (b) game events inserted in the game world to create specific experiences (Abdul Jabbar & Felicia, 2015). In spite of the fact that academics and game developers may utilize varying taxonomy to categorize games, the majority broadly agree on the following seven genres (Gros, 2007):

1. Action games: response-based video games.

2. Adventure games: the player answers the problems to progress through levels within a virtual world.
3. Fighting games: these involve fighting with computer-controlled characters or those controlled by other players.
4. Role-playing games: players expect the roles of fictional characters.
5. Simulations: games shaped after natural or man-made systems or phenomena, in which players need to achieve pre-specified goals.
6. Sports games: these are based on different kinds of sports.
7. Strategy games: these recreate historical scenes, in which players need to devise an appropriate strategy to achieve the goal (Vlachopoulos & Makri, 2017).

Various group of specific applications of computer-based education, computer educational game, educational software, instructive networks is being developed toward integration with educational instruments that advance collaboration and creativity and create value in the classroom. In addition, soft pedagogical instruments like creativity and collaboration become one of the foundations of educational efficiency. Active use of digital educational games and simulations in contemporary universities challenges longstanding educational standards by setting up new educational environments. Unlike entertainment games developed mostly for fun and recreation, educational games and simulators serve the goals of learning and behavior change (Sanina *et al.*, 2020).

Computer-based learning is one of the most established and useful tools utilized broadly in contemporary education. This kind of learning increases students' motivation to acquire new knowledge and simplifies the assessment procedure. The development of IT framework in universities, the active learning approach, and collaborative and lifelong learning are significant trends that mark the new challenges of education development. Still, it is clear that any the IT framework becomes educationally efficient only if it is enhanced by human participation. Students are not robots, and creative and collaborative involvement in the process of computer-assisted learning can be utilized to increase the efficiency of the educational procedure (Sanina *et al.*, 2020). The utilization of games to promote student's learning has been done in the past to catch student's enthusiasm as they learn better when they are motivated. The majority of students have primary contact with computer games before their formal computer education begins, and adequate

computer games can attract and motivate them to learn more. Computer games as educational tools also have an intrinsic persuasive factor that encourages curiosity and creates an impression on the students that they are in charge of their own learning (Burguillo, 2010).

The digital simulation game is a goal-oriented re-enactment of a real-world procedure, framework, or phenomenon expected to help to learn academic content and created it in the form of software or with the utilization of a digital platform (Gros, 2007). Digital simulation games as Susi *et al.* (2007) mentioned, encourage students to apply their knowledge to real-world issues utilizing a scenario-based approach. This helps to train numerous critical skills like analytical skills, strategic skills, problem-solving skills, self-monitoring, and social skills, including interpersonal communication, teamwork, collaboration, negotiation, knowledge sharing, group decision-making (Sanina *et al.*, 2020).

Digital or web-based games have increasingly supported learning recently. In the context of online education also, research in the educational game area attracts a significant amount of interest from the scientific and educational community, for instance, tutors, students and game designers (Buckless *et al.*, 2014). With the growing expansion of technology, educators and those who create educational policies are tempted in presenting innovative technological tools, such as virtual worlds, video games, and Massive Multi-Player Online Games (Vlachopoulos & Makri, 2017).

2.2.5. Educational Games' Measurement

Numerous examinations on games played for amusement purposes just have explored the characteristics and causes of enjoyment, motivation, and engagement. As conducted by Boyle *et al.* (2012) and Connolly *et al.* (2012), engagement in games is identified with a wide range of components inherent in the games (e.g., design), as well as in the attributes of players. As indicated by Jabbar and Felicia (2015), these elements and attributes incorporate a motivation to play (Lee & LaRose, 2007), players' characteristics (Sell *et al.*, 2008), the personalities of the players (Teng, 2008), players' genders (Chou & Tsai, 2007), players' ages (Eglesz *et al.*, 2005), game type (Lee *et al.*, 2007), and game characteristics (Lucas & Sherry, 2004).

The concept of intellectual engagement for learning can help evaluate GBL activities. It incorporates both cognitive and emotional aspects and is grounded in human psychology (Boyle *et al.*, 2012;

Connolly *et al.*, 2012). The gaming components identified with engagement evaluated for Jabbar and Felicia (2015) study was therefore categorized into four key components that addressed both cognitive and emotional aspects of engagement: (a) motivational components (i.e., elements that impact players' thoughts, actions, and reactions regarding meaningful gameplay and learning); (b) interactive components (i.e., elements that provide players with opportunities to participate and be involved in gaming activities); (c) fun components (i.e., elements that provide a sense of enjoyment and excitement to the player); and (d) multimedia components (i.e., elements that engage the player through physical and/or multisensory interaction). Engagement components in GBL settings were categorized utilizing this classification, in line with the literature, so as to capture key elements that create a dynamic experience and entertainment and to identify game attributes identified with learning (Bedwell *et al.*, 2012), as shown in Table 2.2.1 (Abdul Jabbar & Felicia, 2015).

	Description	Attributes
Motivational elements (usefulness)	Elements that affect players' thoughts, actions, and reactions regarding meaningful gameplay and learning	Objectives (race, escape, construct, explore, and solution), rules, choices, progress, boundaries, outcomes (win/lose, ranking, and reward), and adaptation
Interactive elements (Interactivity)	Elements that give players opportunities for participation and involvement in gaming activities	Procedures, role-play, resources(multiple objects, multiple media, and people) and conflicts (dilemmas and obstacles)
Fun elements (Playfulness)	Elements that trigger players' sense of enjoyment and excitement	Challenges (goals, feedback, and control), play, premise/fantasy, immersion, story/narration, characters, objects, and mystery
Multimedia elements (Attractiveness)	Elements that attract players' physical attention	Sensory stimuli (graphics, animation, video, text, and audio)

Table 2.2.1. Gaming Elements

Source: adapted from Abdul Jabbar & Felicia (2015)

2.2.6. Game-based learning effectiveness

Gamification as an original and comprehensive framework would be more effective in education as some studies have indicated the positive effects of educational games (Ebner & Holzinger, 2007;Yildirim, 2017). There is broad literature investigating the potential learning benefits offered by GBL, which can be characterized as the utilization of game-based technology to deliver, support, and enhance teaching, learning, assessment, and evaluation (Vlachopoulos & Makri, 2017). Among the various activities that can be utilized to execute a dynamic learning methodology, past research

shows that the utilization of games with educational purposes encourages students' assimilation of the ideas and concepts presented in class as well as improves students' confidence (Ku *et al.*, 2014). Gamification of educational procedures can be described as the successful coordination of the gamification system into the educational program in order to enhance students' motivation, academic achievement, and attitudes toward lessons (Yildirim, 2017).

Both instructors and students are interested in high outcomes, and the combination of games and simulations helps to achieve better engagement in the learning procedure (Vlachopoulos & Makri, 2017), to assimilate classroom information and knowledge in a student-friendly way, and to have opportunities to practice skills that are impossible or too expensive to practice in the real world. Combining the two different logic of games and simulations fosters four core elements: motivational, interactive, fun, and multimedia (Jabbar & Felicia, 2015; Sanina *et al.*, 2020).

According to Garris *et al.*, (2002) students will be self-motivated and guided when they find the learning activity engaging in itself and the outcome worth striving for. They suggest that an educational game should introduce new learning through game attributes (game mechanics). The game ought to permit students to take autonomous actions (either individually or in a group) and encourage behaviors, such as persistence and timeliness. These behaviors and actions of students should result in instant feedback on their progress and performance within the game (and thus, on the learning) (Menon & Romero, 2019).

GBL provides an avenue to dynamic learning and offers students the chance to apply what they learn in an enjoyable, stress-free environment (Menon & Romero, 2019). Instructional games favour an active attitude in class as well as cultivate knowledge acquisition in a more engaging environment, facilitating students' learning process and increasing their satisfaction. Previous examinations assume that the gamification of teaching is a critical direction to follow, permitting students to become the focal point of their learning procedure while expanding their inspiration and active participation.

GBL while developing intellectual and creative resources of personality, makes it possible to utilize fundamental knowledge and principles in wide and unpredicted situations, helps to project behavior strategies, encourages carrying on dialogue and collaborating with others (Rodina & Chekushkina,

2015). Perryer *et al.* (2016) indicate that gamification advances the improvement of delicate skills such as teamwork, oral communication, study habits. Gil-Doménech and Berbegal-Mirabent (2019) show how dynamic learning methods can boost students' intrinsic inspiration in a low-motivated environment (Bebegal-Mirabent *et al.*, 2020). Evidence proposes that dynamic learning assists students with engaging in their learning procedure and improves their achievements (Gil-Doménech & Berbegal-Mirabent, 2019).

Engagement influences learning and motivation (Guthrie & McCann, 1997; Smith, 2012) and has been the subject of an expanding number of studies on educational games (Bouvier *et al.*, 2013; Clark, Tanner-Smith, & Killingsworth, 2013; Connolly *et al.*, 2012; Markey & Leeder, 2011). This impact happens because it was observed that games can engage players to learn (Dickey, 2005; Whitton, 2011), can incorporate multi-sensory settings, and can stimulate players' ability to think and create meaning. The main findings to date emphasize the significance of both enjoyment and motivation to support players' engagement (Abdul Jabbar & Felicia, 2015). When planning a game-based activity, besides utilizing extrinsic inspirations (for example prizes and incentives) it is of most significance including components that can also intrinsically motivate them.

Students' consideration, interest, and motivation are carefully associated with student achievement. Gamification may alleviate student-driven issues in the teaching procedure, such as lack of motivation and interest, through the effective utilization of learning from mistakes and the promotion of students sentimentally and socially. In this regard, gamification of education can be characterized as the transference of game design to the educational procedure for the purpose of increasing students' attention and motivation and improving student achievement and attitudes toward lessons (Yildirim, 2017).

When participating in multimedia or game development tasks, students need to collect, analyze and organize information based on their interpretation of the learning tasks, their experience of handling relevant events, and appreciation of the learning contents. Such a learning method can engage students in continuous interactions with the learning tasks, contents and contexts, which has great potential in helping them develop problem-solving skills and develop new knowledge (Hwang *et al.*, 2014). During game-based training, students acquire critical skills, such as

leadership, interpersonal communication, decision-making, teamwork, task prioritizing and stress management. The practical scenario may be carried out individually or within a team, leading to collaboration and knowledge sharing. Games also require the adoption of high-quality support structures, student participation, as well as the promotion of cognitive and metacognitive skills (Vlachopoulos & Makri, 2017). Table 2.2.2. briefly describes the effectiveness of games in the education system.

Reference	Effectiveness of games in education system
<i>(Garris et al., 2002), (Ku et al., 2014)</i>	Increasing students' confidence and enhancing their motivation by incorporating challenge, curiosity and fantasy to a particular issue.
<i>(Gil-Doménech & Berbegal-Mirabent, 2019)</i>	Games can positively shape student co-creation behavior.
<i>(Yildirim, 2017)</i>	Games enhance students' motivation, academic achievement, and attitudes toward lessons.
<i>(Lee et al., 2015)</i>	Games improve collaboration skills.
<i>(Cortez et al., Aravena, 2009), (Gil-Doménech & Berbegal-Mirabent, 2019)</i>	Games improve students' cultivate activity, creativity, imagination, and group work skills-along with academic achievement.
<i>(Menon & Romero, 2019)</i>	GBL provides an avenue to dynamic learning and offers students the chance to apply what they learn in an enjoyable, stress-free environment and encourage behaviors, such as persistence and timeliness.
<i>(Garris et al., 2002)</i>	Students will be self-motivated and guided in a game-based environment.
<i>(Rodina & Chekushkina, 2015), (Hwang et al., 2014)</i>	Games improve students' abilities to size up non-standard, uncertain situations, abilities for self-development, self-education, motivation for innovation, for comprehension of existence and one's own being with the account taken of pressing social requests.
<i>(Torre & Berbegal-Mirabent, 2020)</i>	The gamification of teaching is a critical direction to follow, permitting students to become the focal point of their learning procedure, improving students' grades and, to some extent, changing their habits.
<i>(Abdul Jabbar & Felicia, 2015)</i>	Games can incorporate multi-sensory settings and can stimulate players' ability to think and create meaning.
<i>(Vlachopoulos & Makri, 2017)</i>	The utilization of game-based technology to deliver, support, and enhance teaching, learning, assessment, and evaluation.

Table 2.2.2. Effectiveness of games in education system

Source: own elaboration

2.2.7. Conclusion

The literature on games for learning is extensive, covering many educational disciplines and types of games. However, the literature specifically addressing games for HE is limited. Games are a sort of problem-based learning, wherein players are given engaging challenges that they must solve by learning and using new skills (Markey & Leeder, 2011). Games can be conceived of as active learning environments in which students can learn by doing, undertaking purposeful and meaningful tasks, reflecting on their experiments and working with people to achieve learning goals.

Empirical studies have indicated expanded knowledge retention by those utilizing an educational game compared to those receiving conventional instruction with lectures and paper-based materials when specific information or concepts are targeted or the game is used as a reinforcement or practice tool. There is broad literature investigating the potential learning benefits offered by GBL, which can be characterized as the utilization of game-based technology to deliver, support, and enhance teaching, learning, assessment, and evaluation.

As the current thesis aims to the student perception of value of GBL in HE, this section critically presents and discusses the HE-games characteristics, categories and measurement. Furthermore, the effectiveness of GBL is offered in detail. Regarding understanding student perception of value of GBL, we conduct a systematic literature review of student perception of value in HE which is presented in the next section.

Section 3. Student Perception of Value in Higher Education- A Systematic Literature Review

Abstract

Value in education is crucial for higher education institutions' (HEI) strategic planning and market orientation. Hence, comprehending, managing, and impacting student perception of value is key for both students and HEIs. Drawing on current literature about student perception of value, this paper aims at presenting a systematic review of the literature. In addition to allowing a comprehensive overview of the topic, such evidence also provides potential alternatives and pathways for future research.

Two databases were selected to search indexed articles. Starting from 136 articles using keywords search, 88 key journal articles were systematically reviewed using both qualitative and quantitative methods for investigation.

Our review synthesizes research under three main topics: (1) Dimensions of student perception of value; (2) Perceived value by students associated with different learning approaches and strategies; (3) Factors impacting upon students' value judgments; (4) Student perception of value's outcomes.

Findings revealed that while there has been a great attention to student perception of value, further research is needed on three aspects: Learning approaches in HE, determinants of student perception of value and outcomes of student perception of value in HE.

Keywords- Student value, Student perception of value, Student perceived value, and higher education

2.3.1. Introduction

Understanding student perception is a significant factor in the success of any new pedagogic and technological initiative as such perceptions directly influence how much effort students will expend on educationally purposeful activities, with direct effects on their learning (Buckley *et al.*, 2006; Rumreich & Kecskemety, 2019). Value perception in the educational context offers a means by which institutions can comprehend, manage and impact value among all stakeholder groups, as well as drive course design and strategic planning (Chung & McLarney, 2000; I. C. L. Ng & Forbes, 2009). Chung and McLarney (2000) contend that the essential aim of the learning experience is to create

value for students.

Value can be thought of in the context of education, wherein three perspectives can be identified: in the first, value has emerged as an important foundation for the dissemination of marketing theory and knowledge with the appearance of HE marketing management textbooks structured around the core theme of value. In this, value is currently part of the curricula of courses focusing on students' learning of concepts that are fundamental to marketing. The second viewpoint takes an organization-wide perspective on value, addressing value as a tool to drive strategic planning and market orientation, and a means to comprehend, manage, and impact value perceptions among all stakeholder groups (Chung & McLarney, 2000; I. C. L. Ng & Forbes, 2009). The third viewpoint, which is central to this study, considers value from the perspective of the student, where the education experience itself is the object of consumption and the student is both the consumer of education and the co-creator of value (Ledden et al., 2011; I. C. L. Ng & Forbes, 2009).

The literature is reviewed in the light of several research questions: 'what are the dimensions of students' perception of value in HE?', 'Which factors are impacting on students' perception of value in HE?', and "What are the consequences of student perception of value in HE?". A systematic review of the literature on this topic can contribute to answering these questions based on mapping extant research.

This article is divided into six parts: We start by presenting the concept of student perception of value in HE; then, the systematic review method is presented; the next section presents the findings, providing a descriptive and thematic discussion of results; research opportunities about the research topic are proposed; finally, conclusion.

2.3.2. Student perception of value in HE

Consumer value is something that is perceived by customers instead of objectively determined by the seller (Khalifa, 2004); indeed, the perceptual nature of consumer value is its most widely accepted characteristic. As indicated by the service dominant logic, value resides not in the product (whether goods, services or experiences, or any offering capable of satisfying a consumer need), yet in the service that the product delivers to the client, for example products do not hold value for a client until or unless they can be utilized. Along these lines, value arises through use or consumption and the

emphasis shifts from the provider to the consumer (Ledden *et al.*, 2011). Value, or value added, refers to the improvement that students gain as a result of their educational experience (knowledge, skills, abilities, and other characteristics). Bennett (2001) describes added value as the difference between the achievements of students when their education is completed and what they have already achieved at the beginning (Deacon & Hajek, 2011).

As indicated by Zeithaml (1988), perceived value is a subjective assessment of the compromise between all that is received (get) and all that is given up (give) during the time spent procuring, utilizing or consuming an object. "Get" reflects all the utilitarian and hedonic benefits got through the purchase or consumption of a product, incorporating its core, intrinsic benefits (functionality), as well as extrinsic perspectives related to its purchase/ownership and consumption (prestige, joy, pride). "Give" addresses the monetary and psychological sacrifices that consumers are prepared to make in order to obtain the product's benefits, incorporating both the price paid and non-monetary costs such as the time and effort spent in their acquisition (Kalafatis & Ledden, 2013).

Holbrook (2012) describes perceptions of value as a result from the interaction between a subject (the consumer) and some object (any product, service, or experience that satisfies a need), and consequently value is experiential, relative among people, contexts and competition, and a preference judgement. Despite acceptance in the literature that value perceptions are dynamic and can change over time, research that explores the temporal nature of value in the education context is limited (Kalafatis & Ledden, 2013). In the current study, we systematically analyze the literature review to clarify the concept of value in HE and the main student perception of value in HE that identified by applying different learning approaches, the elements impacting student perception of value and its consequences.

2.3.3.Method

This research is based on systematic literature review which varies from a traditional review. A systematic review points out the most important gaps, contributing to theory development (Paul & Criado, 2020).

The keywords for the search were composed of three definitions found from the theoretical discussion above. Domains of research were operationalized through six keywords, in particular, "Student",

“Student value”, “perception of value”, “Student perception of value”, “student perceived value”, and “higher education”. Target articles were required to match at least one word. Although systematic reviews can include other types of publications, to guarantee quality and decline the sample to a manageable amount, this investigation focused on peer-reviewed academic journal papers and conference proceedings written in English.

The investigation was conducted in the following research databases: Web of Science (Web of Knowledge/ Clarivate analytics) and Scopus. We did not specify a coverage period, in order to classify all relevant papers regardless of the publication date. The search was carried out on 01/2021. Our search resulted in an initial list of 207 which was reduced to 136 relevant articles based on the title and abstract analysis. These papers were analyzed in an iterative process, focusing on the title, abstract and relevant parts of the full text aiming at identifying the papers with a solid focus on student perception of value in HE. Articles were both empirical and conceptual. The final list, with 74 articles and 14 conference proceedings, was then object of a both descriptive and thematic analysis.

The results were structured into two parts. First, we provided a quantitative descriptive analysis to get an overview of the research agenda on students’ perception of value in HE. Second, we presented a qualitative thematic analysis to provide an in-depth analysis of students’ perception of value in HE. For the descriptive analyses, categories that defined the articles were selected, such as the year of publication, journal, nations focused on in studies, the classification of papers, methodology, and findings. This synthesis process is deductive and interpretative. The objective of the thematic analysis was to systematically classify the content of the papers and identify relationships (Lane *et al.*, 2006).

2.3.4.Results

The results are structured into descriptive and thematic analyses.

2.3.4.1. Descriptive analyses

The review was structured into the following subjects: year of publication; journals; location of the study; methods of research; and paper impact.

While the first paper meeting the inclusion criteria was published in 2000, most of the studies were published in the second decade (between 2010 and 2020), which may hint that this is still a recent

area of investigation, as seen in Figure 1. This finding evidences the growing attention among scientists in recent years in discussing the subject of student perception of value in HE. This can be due to an increased awareness of the need to be responsive to students' needs and expectations, starting with a better understanding of value perceived by students in HE (figure 2.3.1).

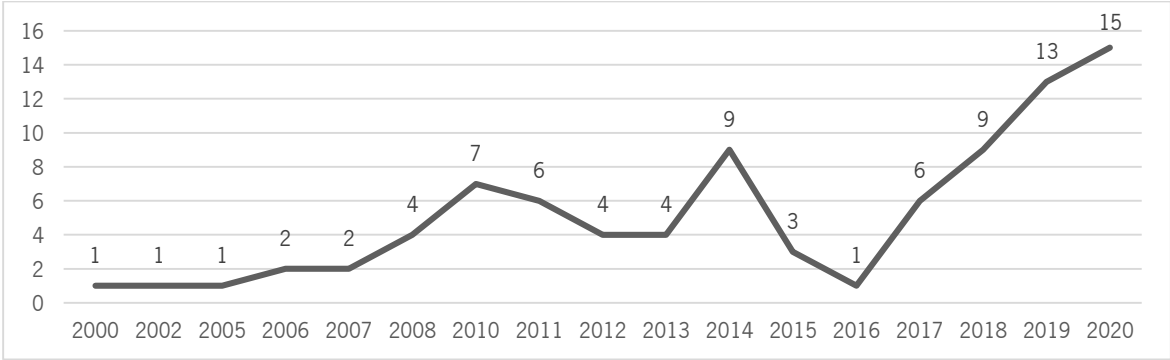


Figure 2.3.1. Distribution of articles by years of publications

The review additionally featured that student perception of value in HE research has been published in a wide variety of educational journals and conferences. ASEE Annual Conference and Exposition, Journal of Marketing for Higher Education, Studies in Higher Education and Australasian Journal of Educational Technology account for the highest number of papers. Hence, a variety of publication outlets focused on education and development are found (figure2.3.2).

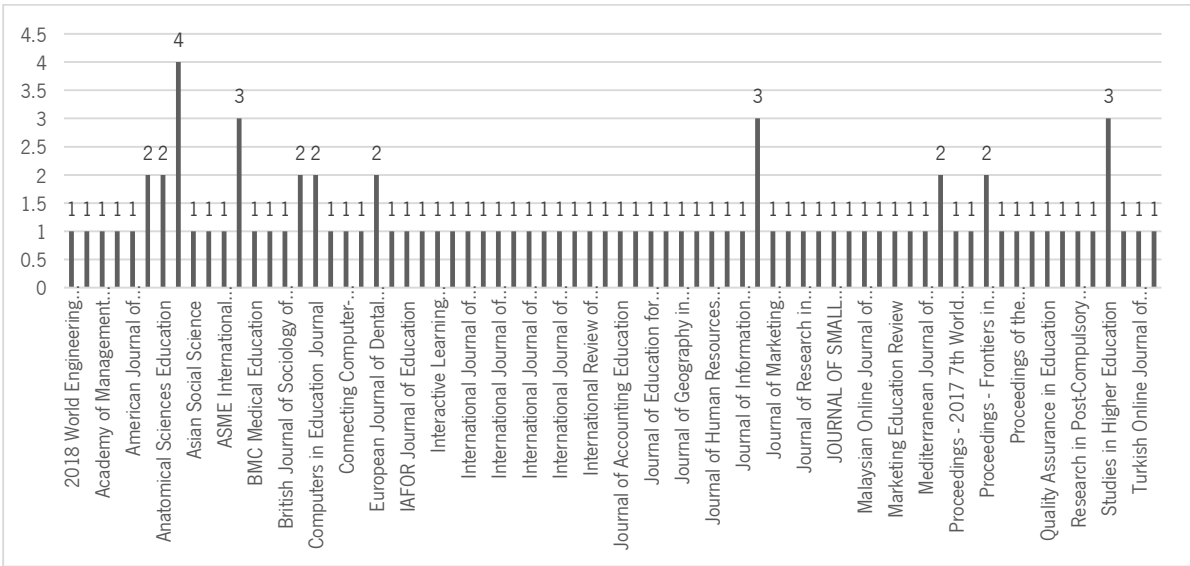


Figure 2.3.2. studies by source of publication

The geographical location of the studies has been analyzed to identify the context where extant

research has been carried out. This analysis shows that the majority of studies have been conducted in developed countries such as the USA, the UK, and Australia. A single-country emphasis is followed by most research (see in Figure 2.3.3).

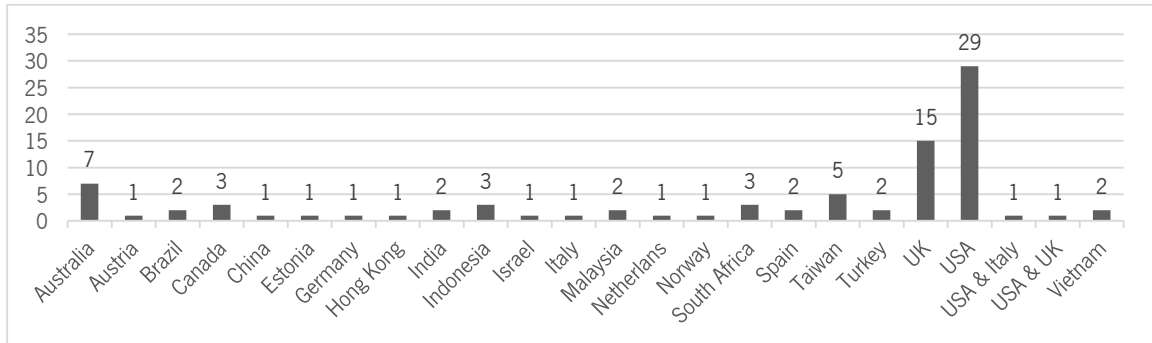


Figure 2.3.3. studies by country of publication

The methodology employed in the studies is presented in Figure 2.3.4. 46 papers were quantitative, while 26 used qualitative approaches and 15 used mixed methodology, among the various methods adopted. The methods of data collection utilized in quantitative research include questionnaires and assessment, academic and cognitive tests, while the methods utilized in qualitative studies incorporate interviews, case studies, and focus groups.

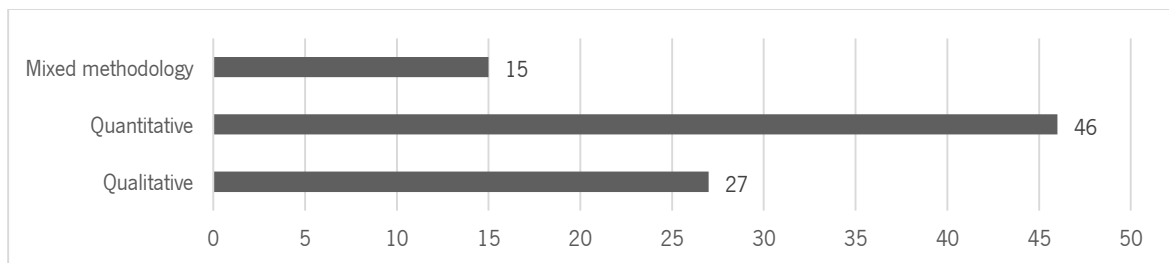


Figure 2.3.4. studies methodological choice

In order to comprehend the impact of these publications, we examined the number of citations and highlighted the 10 most cited articles in Table 2.3.1.

Authors	Title	Source title	Cited by	Highlights
<i>Archer, & Hutchings (2000)</i>	Bettering yourself? Discourses of risk, cost and benefit in ethnically diverse, young working-class non-participants' constructions of higher education	<i>British Journal of Sociology of Education</i>	463	Focuses upon non-participants' structures of risks, costs and benefits during application, participation and graduation. These perceptions of 'value' are debated amongst ethnically diverse 'working class' groups.
<i>Machemer, Crawford (2007)</i>	Student perceptions of active learning in a large cross-disciplinary classroom	<i>Active Learning in Higher Education</i>	371	Reports how students value active, cooperative, and traditional learning activities within a single large cross-disciplinary class.

<i>Woodall et al. (2014)</i>	Making sense of higher education: students as consumers and the value of the university experience	<i>Studies in Higher Education</i>	334	Explores the relationship between student value and HE, and proposes how this may be better understood and operationalized.
<i>Helgesen (2008)</i>	Marketing for Higher Education: A Relationship Marketing Approach	<i>Journal of Marketing for Higher Education</i>	247	The Relationship Marketing Approach means that great significance is attached to the creation of student value.
<i>Petruzzellis & Romanazzi (2010)</i>	Educational value: How students choose university: Evidence from an Italian university	<i>International Journal of Educational Management</i>	175	Measures students' perceptions of value that are impacted by differences in costs (monetary and non-monetary), students' attitudes and socio-demographic features.
<i>Carvalho & Mota (2010)</i>	The role of trust in creating value and student loyalty in relational exchanges between higher education institutions and their students	<i>Journal of Marketing for Higher Education</i>	153	Explores the process by which trust is first developed and then translated into students' perceived value of the HE institutions, eventually leading to the development of student loyalty toward those institutions.
<i>Jones (2010)</i>	Entrepreneurship education: revisiting our role and its purpose	<i>Journal of Small Business and Enterprise Development</i>	133	Goes beyond any assumed notion that entrepreneurship education is beneficial to students in HE, to question its fundamental value.
<i>Ain et al. (2016)</i>	The influence of learning value on learning management system use: An extension of UTAUT2	<i>Information Development</i>	118	The perceived value construct of the Unified Theory of Acceptance and Use of Technology (UTAUT2) is examined in the context of a learning management system (LMS)
<i>Ledden et al. (2011)</i>	The idiosyncratic behavior of service quality, value, satisfaction, and intention to recommend in higher education: An empirical examination	<i>Journal of Marketing Management</i>	109	The influence of service quality on the formation of perceptions of value is confirmed.
<i>Mitra et al. (2010)</i>	The use of video to enable deep learning	<i>Research in Post-Compulsory Education</i>	107	Investigates student perceptions of the use of video in lectures and seminars in order to assess whether video can improve student learning and encourage critical engagement with topics.

Table 2.3.1. Number of Citations

Source: own elaboration

The background of the samples employed in the studies are presented in Figure 2.3.5. 35% of studies do not focus on a specific group of students, 10% examined engineering students' perception of value of different learning approaches in this area, followed by 6% of business students, 6% of medical students and 5% of doctoral students. This shows that research has looked at a diversity of educational backgrounds.

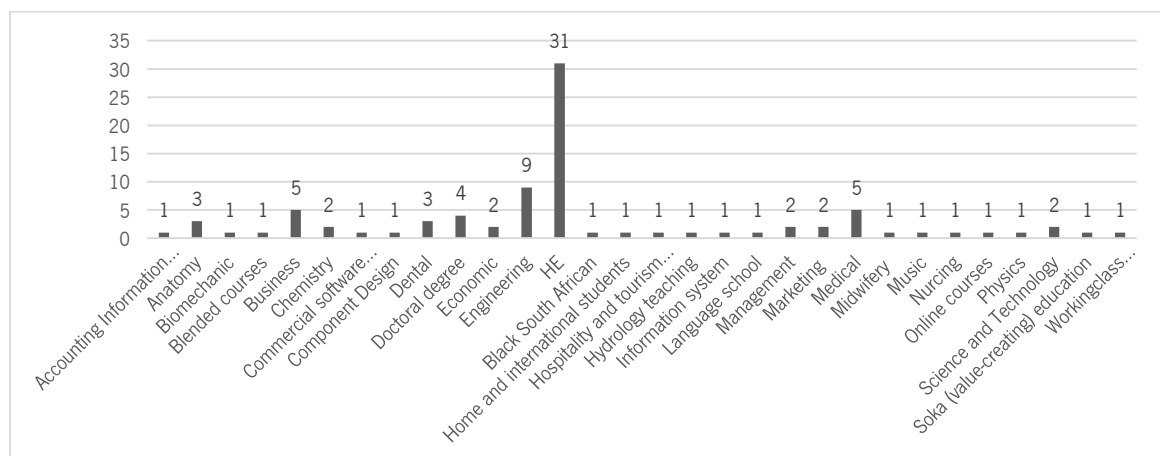


Figure 2.3.5. studies sample choice

2.3.4.2. Thematic analysis

In order to establish a systematic view of the published works on student perception of value in HE, a thematic analysis was conducted. Using a deductive approach, the selected papers have been categorized according to: (1) Dimensions of student perception of value; (2) Perceived value by students associated with different learning approaches and strategies; (3) Factors impacting upon students' value judgments; (4) Student perception of value's outcomes.

(1) Dimensions of student perception of value

The measurement of student value in HE began with Webb and Jagun (1997) and LeBlanc and Nguyen (1999). They characterized it as a product or service feature that students find to be of benefit or value (attribute), and benefit or value that students derive from their association with an offering (outcomes) (Woodall *et al.*, 2014). Alves and Raposo (2007) have adopted this measure, adding to it a single 'value-for-money' item. Both, Ledden *et al.*, (2007) and Ledden and Kalafatis (2010), adapted Cronin *et al.*, (1997) as a basis for both monetary, and non-monetary sacrifices (time, effort and perceived risk). Perceived risk incorporates: a) financial risk of a losing money when service does not satisfy students' expectations, b) the performance risk that a service does not work as a student expects, c) physical risk of a student harming themselves or others while using a service, d) the social risk of a negative change in a student's social status when they choose a service, and e) the psychological risk of a negative impact on a student's ego from choosing the wrong product/service and finally f) time risk of losing the time spent searching for a service that does not meet a student's expectations (Cao & Doan, 2019).

Tuition fee and the received benefit of services and value content of courses, contribution of lectures to the improvement of student, hard and soft skills have been among the indicators measuring the student perceived value on the university (Azis *et al.*, 2020; LeBlanc & Nguyen, 1999; Ledden & Kalafatis, 2010; Ledden *et al.*, 2007). Petruzzellis and Romanazzi (2010), Relyea *et al.* (2008) and Schmidt (2002) have used similar elements (Woodall *et al.*, 2014).

Additional considerations should be taken into account in the case of value assessment by students. The following attributes assumed to be significant in determining student value have been included in Helgesen (2008) study: service quality, facilities available, IT (information technology), and social

activities.

Customers typically evaluate value comparing price (costs) to perceived service quality, but most students may not have the proper frame of reference to make such a comparison. In fact, students often do not pay the full (or any) cost of their education and are not able to understand the importance of certain subjects of learning and/or the value of certain activities (especially in the short term) (Bay & Daniel, 2001). In addition, it can take students years to recognize and calculate the real value of the education they receive (Carvalho & de Oliveira Mota, 2010).

Ledden and Kalafatis (2010) and Sampaio *et al.*, (2012) assume five dimensions of value in HEIs: (a) functional value; (b) social value; (c) epistemic value; (d) emotional value; (e) conditional dimension

Functional value: In a university education setting, functional value is the perception of students that the chosen degree/program and the HEI can provide adequate education and support their career development (Ledden & Kalafatis, 2010). Some examples would be guaranteed future employment, a good salary, and promotions (LeBlanc & Nguyen, 1999); the development of knowledge and skills that help to achieve career goals (Bruce & Edgington, 2008; LeBlanc & Nguyen, 1999; I. C. L. Ng & Forbes, 2009; Sampaio *et al.*, 2012; Stafford, 1994).

In what concerns, some studies such as Zambo *et al.* (2014), Conrey *et al.* (2020), Brennan *et al.*, (2010), Lebler and Hodges (2017), Hall (2019), and Bryan and Guccione (2018) used “Career Value” instead of functional value and indicate the Caire and Becker (1967) human capital theory, which posited the attainment of additional education should increase one’s knowledge, skills, and values, and this capital is frequently correlated with economic gains and job. Hesketh (2000, p6) proposes ‘many students expect their HE to augment their future career ambitions’.

Social value: Social value is characterized as the perceived utility gained from a product’s association with a particular demographic, cultural or social group. According to Ledden *et al.*, (2007), in the educational context, social value is reflected through students’ beliefs that individuals who impact, or are important to them, consider that taking the degree is a good thing to do, and, in addition, that the degree will allow them to be viewed favorably by a prospective employer (LeBlanc & Nguyen, 1999; Ledden *et al.*, 2007; Sampaio *et al.*, 2012). In addition, the opinion of reference

groups can play an important part in the consumer's value judgment (Ledden *et al.*, 2011).

Several authors examine the social value of student in HE (Boud & Lee, 2005; Chamillard & Braun, 2000; Conrey *et al.*, 2020; Diemer *et al.*, 2012; Hall, 2019; Jablonski, 2001; Kemp *et al.*, 2014; Lin & Huang, 2020; Pearson & Brew, 2002; Rumreich & Kecskemety, 2019; Wellington & Sikes, 2006; Zambo *et al.*, 2014).

For instance, as indicated by Bryan and Guccione (2018), social networks were strong through the doctorate and could tolerate years after graduation; for some this meant gaining valuable relationships. Another example indicated by Crede and Borrego (2014) perception of value to the group measures whether students feel their work is valued by the group, whether their advisor values their work, and if they feel their work is a valuable contribution to the field.

Epistemic value: There is a clear relevance of epistemic value to the educational context, in which the primary benefit is obtaining new knowledge (Stafford, 1994). Epistemic value alludes to benefits derived through a product's ability to arouse curiosity, provide novelty or fulfill a desire for knowledge (Sampaio *et al.*, 2012). Elsey (2007) identified skill knowledge and formation as key inspirations in the pursuit of a doctoral degree. Moreover, Wellington and Sikes (2006) indicated that graduates' participation in professional programs and projects during their education led to expanded reflective abilities, the ability to view alternative perspectives, and the ability to examine data with greater skill (Conrey *et al.*, 2020). Skills value included technical skills – specific knowledge, laboratory techniques, and report writing – the most valuable were abstract cognitive skills, including critical thinking and argument construction (Bryan & Guccione, 2018).

Emotional value: As indicated by LeBlanc and Nguyen (1999) and Ledden and Kalafatis (2010), emotional value is acknowledged through the affective states that are stimulated in the student while studying their degree, for example, feelings of pride and self-achievement. Emotional value is described as the ability of a service to arouse feelings or affective states. In the context of education, whether learners are glad that they chose the course and whether they find the course interesting are considered examples of emotional value (Ledden *et al.*, 2011; Sampaio *et al.*, 2012). Brailsford (2010) identified key themes as motivators that encompassed an overall interest in the dissertation topic, and a desire to complete the highest levels of study. Also, Scott *et al.*, (2004) discovered that

some doctoral graduates were intrinsically persuaded and completed their doctoral degrees for intellectual challenge and personal satisfaction. Barnett *et al.*, (2013) shared the intrinsic requirement for knowledge as an important motivator. The ability to pursue her degree for purely personal and intellectual reasons (Conrey *et al.*, 2020).

Conditional dimension: Conditional value alludes to the arrangement of circumstances that clients face when making a choice. For instance, the size of the department and the number of students in a class are situational variables that can affect the value of the educational experience (Cao & Doan, 2019; LeBlanc & Nguyen, 1999). This value includes specific benefits that include teaching materials, computer laboratories, libraries, etc. (Sampaio *et al.*, 2012).

Image - Finally, to the above dimension image value is added to represent the benefits of utilization that derive from studying at a well-thought-of institution: the status and reputation of the HEIs impact perceptions of the value of the qualification gained therein (LeBlanc & Nguyen, 1999; Ledden & Kalafatis, 2010; Ledden *et al.*, 2007; N. Nguyen & LeBlanc, 2001).

Figure 6 shows students' perception of value dimensions in HE. The several dimensions of student perceived value can be grouped under six main categories: (a) functional value; (b) social value; (c) epistemic value; (d) emotional value; (e) conditional dimension; (f) Image.

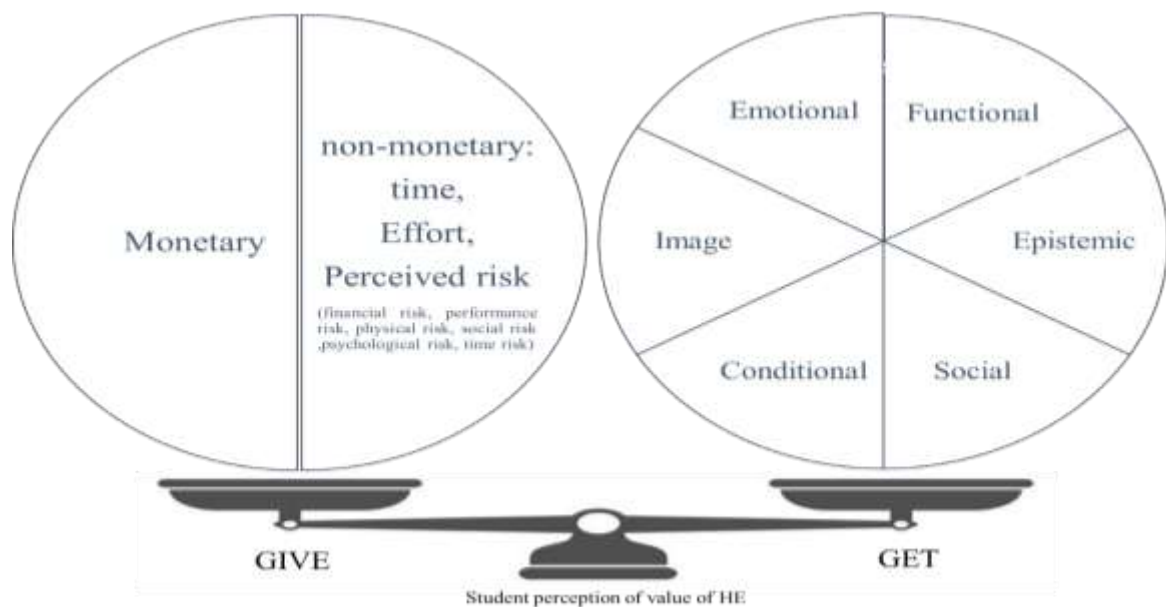


Figure 2.3.6. Student perception of value

(2) Perceived value by students associated with different learning approaches and strategies

In this section we present the main learning approaches applied in HEIs. Moreover, the value perceived by students associated with these learning approaches. The following main learning approaches in HEIs are included: (a) lecture-based approach; (b) active learning approach (Collaborative-based Learning; Problem-based learning; Project-based learning; Game-based learning.); (c) online; (d) blended learning.

Lecture-based approach: Lecturing is one of the most noticeable instructing techniques utilized in colleges and universities today.

Active learning approach: Active learning comes in different structures and typically involves students applying their knowledge in meaningful ways, utilizing higher order thinking skills, and reflecting on their learning. Active learning systems are viewed as student-centred because the student manages how individual learning goals are achieved (Kay *et al.*, 2019). Some evidence recommends that active learning methods are effective and superior to lectures in developing thinking and problem-solving skills, improving student perspectives and achievement, and engaging students in learning. Additional research shows that collaboration, often part of an active learning approach, advances critical thinking and deeper understanding, improves retention and learning results, expands student interest, and sets conditions for students to take responsibility for their learning.

Online: online context is limited by the impossibility of a fluent talk and the lack of individual and direct contact with teachers and classmates.

Blended learning (Flipped-classroom): According to different research results, students' achievement and their attitudes toward lessons in a blended learning setting are more positive compared to either distance learning or face-to-face instruction. Blended learning brings together the positive aspects of distance learning and face-to-face instruction to some extent. Blended learning can be characterized as completing face-to-face learning together with online learning (Ruizacárate *et al.*, 2013; Tucker, 2012; Yildirim, 2017).

Active learning includes different pedagogic strategies such as Collaborative-based Learning; Problem-based learning; Project-based learning; and Game-based learning.

Collaborative-based Learning: focuses on activities that maximize the collaboration among students, either in couples or small groups, to improve their learning activities and results. The idea is to enhance the trading of information and knowledge among the students to motivate their own learning (Burguillo, 2010; Lee *et al.*, 2015).

Problem-based learning is a student-centred instructional procedure in which students collaboratively solve issues and reflect on their experiences. In this approach, learning is driven by providing open-ended issues where students usually work in small collaborative groups and they are encouraged to take the responsibility for organizing their group, and manage the learning process with specific support from a guide or teacher that play the role of learning facilitator.

Project-based learning provides complex tasks based on challenging questions that incorporate the students' decision making, problem solving, investigative skills, and reflection that additionally, are supported by a tutor that provides facilitation (Burguillo, 2010).

Game-based learning is viewed as a potential method for increasing students' confidence and enhancing their motivation by incorporating challenge, curiosity and fantasy to a particular issue (Garris *et al.*, 2002).

Table 2.3.2 this table shows the perceived value by students associated with different learning strategies

References	learning approaches and strategies	Perceived value by students
(Bass <i>et al.</i> , 2020)	Holistic and structured model of reflection	Safe space within a circle of trust, deep personal learning, consistency of application by skilled facilitators, integration and connection
(Mosier <i>et al.</i> , 2020)	Coursework for career	Emotion, goal, direction, strength, and consistency
(Knudson, 2020)	Active learning, and group learning	Autonomy, and condition
(Conrey <i>et al.</i> , 2020)	Completing the doctoral degree	Career opportunities, research publication, increased confidence, and becoming a role model. Generally, career value, skill value, personal value, and social value.
(Lin & Huang, 2020)	Team-based learning, Flipped classroom	Increase individual learning, social and dynamic interactions and interdependent relationships
(Melser <i>et al.</i> , 2020)	Self- and peer assessments	Self-confidence, deep-level learning and critical thinking, collaborative skills, engagement in reflection and exploration of ideas, and collaborative skills, practicing, planning and teamwork, gain more work-related skills and work-integrated learning and develop taking responsibility for own learning; a better

		understanding of the subject matter, and own values and judgements and critical reflection skills
<i>(Freeman et al., 2020)</i>	Feedback	Clinical confidence, skill level and knowledge
<i>(Nadelson et al., 2020)</i>	Makerspaces	Control of learning and learning activities, growth mindset, advance learning goal orientation
<i>(Sherman & Boukydis, 2020)</i>	Experiential learning	Knowledge and skills, and potential for positively contributing to societal welfare
<i>(Phuc et al., 2020)</i>	Outcome-based education (OBE)	Professional knowledge, the ability to detect and solve problems, team work and communication skills and work attitude
<i>(Kulkarni & Vinuales, 2020)</i>	Course title	Employability
<i>(Meseguer-Artola et al., 2020)</i>	Wikipedia as a primary learning resource	Condition, They use the Wikipedia as a resource or material next to their educational materials (easy and up to date)
<i>(Kay et al., 2020)</i>	Free-to-use question-generation application (PeerWise)	Ownership of learning and deep learning
<i>(Rumreich & Kecskemety, 2019)</i>	iPad and other technologies and applications	Social, and conditional dimension
<i>(Hall, 2019)</i>	Completing the popular music performance degree	Intrinsic motivation and societal influence, social, emotional and employability
<i>(Miertschin et al., 2019)</i>	Technology-based learning	Learning, enthusiasm , condition, and epistemic value
<i>(Jones & Andrews, 2019)</i>	Faculty-student coaching (FSC)	Knowledge Acquisition, develop skills and attitudes, and value for money
<i>(Shih et al., 2019)</i>	Flipped classrooms and Self-regulated learning (SRL)	Understanding of the learning content, social relationship, social cognitive perspective, meaningful learning, skills such as goal setting, time management, and Condition
<i>(Cao & Doan, 2019)</i>	High quality program	Emotional value and service quality
<i>(Bietzk et al., 2019)</i>	Anatomy teaching GEOFF model	Confidence, knowledge and enjoyment
<i>(Mascarenhas et al., 2019)</i>	Peer mentoring program	Comfort and guidance, helping the student to deal with stressful situations
<i>(Van Loon, 2019)</i>	Active-learning methods (homework-based projects)	Enjoy, understanding of theory, research skills, and their ability to select, organize and present information, deeper understanding, problem-solving skills, ownership and responsibility for their own learning, condition, more enthusiastic about the topic and more engaged with the material, employability
<i>(Jena, 2019)</i>	Business analytics course	Enjoyment
<i>(Jordaan & Maharaj, 2019)</i>	Promoting diversity in a Community-based Project	Positive self-concept, problem-solving skills, growth in leadership and cultural awareness or understanding, a high level of public interest, condition, cultivate personal, social and cultural values, personal growth experience
<i>(Abdunabi et al., 2019)</i>	Learn programming	Self-efficacy, learning programming skills, deep-level of learning techniques, social dialogue, condition
<i>(Wong et al., 2019)</i>	Student-to-Student Dental Local Anesthetic Preclinical Training	Anxiety and confidence (deep learning)
<i>(Bryan & Guccione, 2018)</i>	Doctoral degree graduation	Career value, skills value, social value, and personal value.
<i>(Rodriguez & Esparragoza, 2018)</i>	Collaborative engineering design project.	Intrinsic, interest and enjoyment, and usefulness
<i>(Strkalj et al., 2018)</i>	Short anatomy videos	Increase learning, enthusiasm , condition, and epistemic,
<i>(Eleazer & Scopa Kelso, 2018)</i>	Anatomy laboratory	Condition and epistemic
<i>(Reddick et al., 2018)</i>	Civic engagement experiences social exchange theory and experiential learning theory	Deep learning,
<i>(Su & Chen, 2018)</i>	Flipped classrooms, Student Question Generation, and Instant Response Technologies	Cognitive, emotional, and contextual factors
<i>(Emblen-Perry, 2018)</i>	Sustainable Strategies Game	Challenge thinking and emotionally engage students, enhancing student achievement, deeper learning, problem-solving and decision-making skills, awareness of personal values and environmental behaviors, confidence, and social

<i>(Tag et al., 2017)</i>	Online studying	Quality and condition
<i>(Galloway, 2017)</i>	Chemistry degree graduation	Skills and career skills, condition, and employability
<i>(Merk et al., 2017)</i>	General pedagogical knowledge (GPK)	Epistemic, and condition
<i>(Poot et al., 2017)</i>	E-learning	Autonomy, Competence, and Relatedness,
<i>(Sun et al., , 2017)</i>	Online interactive learning tool LearnSmart	Improving learning, and better learning outcomes, perceived challenge, competency
<i>(Lusiah et al., 2017)</i>	University Image	Image
<i>(Ain et al., 2016)</i>	Unified Theory of Acceptance and Use of Technology (UTAUT2)	Social and learning value, facilitating conditions
<i>(Barker et al., 2015)</i>	Lecture recording (video usage)	Condition, learning skills, epistemic and self-perceived competence
<i>(Hashim et al., 2015)</i>	University image	Image
<i>(Kemp et al., 2014)</i>	Multiple learning relationship	Social, condition, learning and emotional, coordination, confidence, and cash
<i>(Crede & Borrego, 2014)</i>	Socialization	Valuing international diversity, or the importance of being able to work in an internationally diverse research team, employability, social
<i>(Perez et al., 2014)</i>	Use iPad	Learned more, more knowledgeable, classroom environment
<i>(Motlhaka, 2014)</i>	Authentic learning	Interesting and enjoyable, emotional involvement and entertainment stimulate, new materials, content retention
<i>(Kam & Katerattanukul, 2014)</i>	Out-of-class learning	Employability, social, learning outcome
<i>(Yu et al., 2014)</i>	Online student question-generation and cooperative learning strategies	Self-perceived competence with regard to the learning content
<i>(Jeyaraj et al., 2014)</i>	Distance learning program	Time schedule, syllabus covered by the course material and stipulated time for the payments of course fees, quality of study material
<i>(Lombard et al., 2014)</i>	Using plastic models, organ dissections, and virtual dissections	Perceived practical value
<i>(Kalafatis & Ledden, 2013)</i>	Carry-over effects	Functional, social, epistemic, emotional, and image
<i>(Ganago & Liao, 2013)</i>	Lab project	Enjoy learning, usefulness of the material, emphasize strategies and skills
<i>(Moore et al., 2013)</i>	Simulation	Epistemic and condition
<i>(Sever et al., 2013)</i>	Video and teaching materials	Instructor-student interaction, time management,
<i>(Cooper et al., 2012)</i>	Project-based learning	Non-technical skills, competency, personal goals, confidence, prior knowledge
<i>(Yu & Wu, 2012)</i>	Question-generation	Deep learning, activate learning, cognitive, affective and social growth, greater understanding, competence and interest actualization.
<i>(Deng & Yuen, 2012)</i>	Academic blogs	Perceived distinct role of blogging compared to other e-learning tools; functionality, and clarified purposes, guidance on how to blog, and facilitation for socialization and collaboration.
<i>(DeHoff et al., , 2011)</i>	Laboratory techniques	Condition, learning outcomes, enjoyable, and social
<i>(Ledden et al., 2011)</i>	Completing degree	Functional, social, epistemic, emotional, and image
<i>(Yu & Wu, 2011)</i>	Online Question-Generation, Peer-Assessment	Learning gains in academic, and self-choice identity
<i>(Bowden & D'Alessandro, 2011)</i>	Interactive Classroom Response Technologies	Functional, and traditional, non-technology condition social interaction (social value)
<i>(Devon et al., 2011)</i>	Multiple choice questions (MCQs) for their peers	Greater understanding, personal reflection and critical thinking
<i>(Silkes, Adler, & Patrick, 2010)</i>	Career Fairs	Knowledge, social, employability
<i>(Ertmer et al., 2010)</i>	Peer feedback and supplementary online discussions	Increase learning, confidence and comfort
<i>(Mitra et al., 2010)</i>	Video	Condition, video can provide useful material for students to engage with
<i>(Mitra et al., 2010)</i>	Entrepreneurship	Unique life-long learning skills, and the attributes that society expects
<i>(Sanchez-Fernandez et al., 2010)</i>	Value creation	The quality of the student-professor interaction, and university image

(Jaakson, 2008)	value in-action	Traditions and continuity, academic community and quality of education, innovation and development and concern for student' values
(Bruff et al., 2008)	Electronic delivery of various aspects of education	Benefits of flexibility in study time, place and method, condition, and social
(Zink et al., , 2008)	The rural physician associate program: The value of immersion learning for third-year medical students	Confidence and autonomy, a nurturing, longitudinal, immersion learning experience that facilitates the gradual but steady development of clinical skills, employability, and relationships develop
(Coupal & Boechler, 2007)	Agile principle working with industry clients	Functional and epistemic
(Machemer & Crawford, 2007)	Teaching techniques (from traditional to cooperative)	Familiarizing the students with ways of knowing; development of intellectual abilities such as critical thinking, logical argument, use of evidence and interpretation; appreciation of knowledge, values, and ethics; and recognizing responsibilities and opportunities in an interconnected world, enjoyed
(Hendel et al., 2006)	Baccalaureate	Personal, professional, and organizational values
(Norwood & Henneberry, 2006)	Feedback	Employability
(Stanley & Edwards, 2005)	CD Rom	Meaningful, condition as a material, deeper understanding of the key concepts involved, employability skills and enhancing learning outcomes

Table 2.3.2. Learning approaches and student perception of value in HE identified in the publications

Source: own elaboration

(3) Factors impacting upon students' value perception

During the consumption experience, there is re-formulation, modification and adjustment in perceptions of educational value. Customer perceived value is highly subjective and produced by customers based on the product's attributes, performance, and results during the consumption process (Cao & Doan, 2019). As Kalafatis and Ledden (2013) indicate students' HE value perceived such as functional, emotional, epistemic, social, and image are shaped by the enactments and activities of both the student and the institution. Several factors may affect the process, including the educational institution, faculty, family, friends, professionals, and colleagues (Hendel *et al.*, 2006).

The perceived benefit depends on the discrepancy between the expected and the experienced levels of service on ten dimensions of the service, including reliability responsiveness, competence, access, courtesy, communication, credibility, security, understanding, and tangibles (Parasuraman *et al.*, 1985). Bryan and Guccione (2018) identified four main affecting variables in making value judgments in HE, which include: (1) Time since graduation, (2) Supervisory relationships, (3) Social connectivity, and (4) Feeling valued at work. Taken together, Tag *et al.*, (2017) argue that the quality of the overall experience of online education rather than its cost is an important influence on students' perception of the value of online education (Bass *et al.*, 2020; Cao & Doan, 2019; Jaakson, 2008; Jeyaraj *et al.*, 2014; Ledden *et al.*, 2011; Shih *et al.*, 2019; Tag *et al.*, 2017).

Girves and Wemmerus (1988) recorded the student/advisor relationship and financial support as being two factors fundamental to graduate education (Bruff *et al.*, 2008; Bryan & Guccione, 2018; Deng & Yuen, 2012; Hendel *et al.*, 2006; Kalafatis & Ledden, 2013; Kemp *et al.*, 2014; Sanchez-Fernandez *et al.*, 2010; Schmidt, 2002). And, student perceived orientation (Bristow and Schneider, 2003) term is characterized as the degree to which an institution has actions and decisions based on the needs of the students as well as the goal and purposes of the institution. Student perceived orientation has a positive impact toward student perceived value. According to Halimatussakdiah *et al.* (2018) perceived value is influenced by institutional image.

Various authors, such as Agarwal and Teas (2001), Brady and Robertson (1999), Chen and Dubinsky (2003), Shukla (2010), Teas and Agarwal (2000), and Yu *et al.* (2011) tested the effect of sacrifice on value. However, this relationship is inconsistent with definitions of value that clearly specify sacrifice (or price alone) as a component part of value, and explicitly not a determinant. The effect of the following constructs on the formation of perceptions of value has also been examined: risk (Agarwal & Teas, 2001; Chen & Dubinsky, 2003; Cao & Doan, 2019; Ledden *et al.*, 2011), students demographics (Bolton & Drew, 1991; Nadelson *et al.*, 2020; Rumreich & Kecskemety, 2019; Tony Woodall *et al.*, 2014; Ledden *et al.*, 2011; Petruzzellis & Romanazzi, 2010; Jaakson, 2008), personal characteristics (Laub, 1999), personal values (Ledden *et al.*, 2007; Deng & Yuen, 2012), valence of experience (Chen & Dubinsky, 2003)(Chen and Dubinsky, 2003; Nadelson *et al.*, 2020; Shih *et al.*, 2019; Cao & Doan, 2019; Abdunabi *et al.*, 2019; Kalafatis & Ledden, 2013; Deacon & Hajek, 2011; Ledden *et al.*, 2011; Bowden & D'Alessandro, 2011; Zink *et al.*, 2008; Helgesen, 2008), course title (Kulkarni & Vinuales, 2020), and trust (Hsu, 2008; Lin & Huang, 2020; Halimatussakdiah *et al.*, 2018; Sampaio *et al.*, 2012; Ledden *et al.*, 2011; Carvalho & de Oliveira Mota, 2010; Sanchez-Fernandez *et al.*, 2010). Moreover, student's trust is the students' confidence in the university's honesty and reliability (Hennig-Thurau *et al.*, 2001). However, given the small number of studies on each of the above constructs the evidence is still uncertain (Ledden *et al.*, 2011).

(4) Students perception of value's outcomes

the revised papers point to several outcomes of student perception of value. Empirical support is found in various investigations that analyzed the effect of value on the formation of:

- (a) satisfaction (Halimatussakdiah *et al.*, 2018; Hume & Mort, 2010; Moliner *et al.*, 2007; Shukla, 2010; Elliott, 2002; O'Bannon *et al.*, 2011; Defranceschi & Ronchetti, 2011; Traphagan *et al.*, 2010; Lancaster *et al.*, 2011; Johnston *et al.*, 2013; Dickson *et al.*, 2012);
- (b) trust (Halimatussakdiah *et al.*, 2018; Moliner *et al.*, 2007)
- (c) intention to repurchase (Brady & Robertson, 1999; Choi *et al.*, 2004; Eggert & Ulaga, 2002; Lam *et al.*, 2004);
- (d) willingness to buy (Chen & Dubinsky, 2003; Kleijnen *et al.*, 2007);
- (e) loyalty (Lai *et al.*, 2009; Lam *et al.*, 2004; Spiteri & Dion, 2004);
- (f) word of mouth or recommendation (Brown & Mazzarol 2009; Bruce & Edgington 2008; Carvalho & de Oliveira Mota 2010; Lai *et al.*, 2012; Ledden *et al.*, 2007; Ledden and Kalafatis, 2010);
- (g) channel choice and peer rating as a method of formative assessment (Nigel, 2001; Yu *et al.*, 2011);
- (h) brand equity (He & Li, 2011) and
- (i) involvement (Lai & Chen, 2011).

Moreover, perceptions of value have been found to influence students' evaluative assessment of the education provision received (Hannaford *et al.*, 2005; Unni, 2005), their sense of satisfaction with the educational experience (Ledden & Kalafatis, 2010; Ledden *et al.*, 2007), and their intention to offer positive word of mouth recommendation (Bruce & Edgington, 2008; Ledden *et al.*, 2011).

Figure 2.3.7 demonstrates the factors impacting upon students' value judgments and students' perception of value consequences.

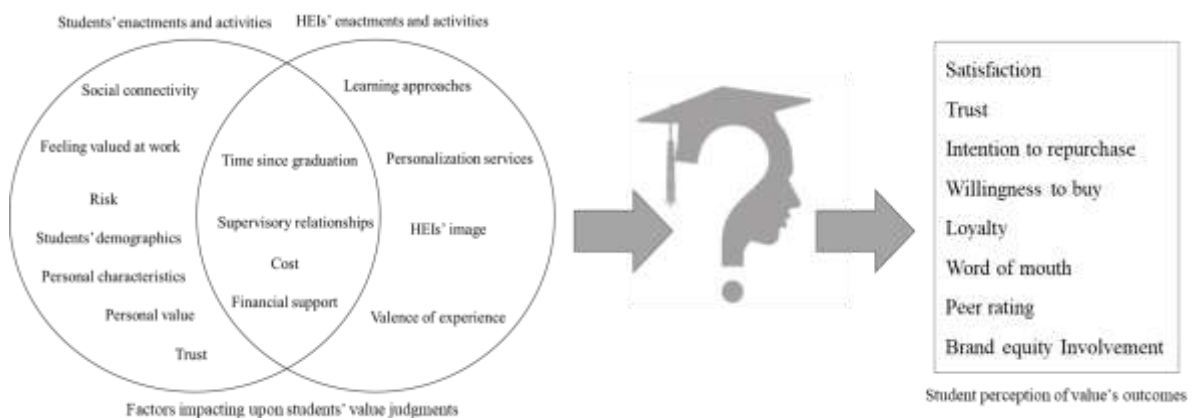


Figure 2.3.7. Factors impacting upon students' value judgments and Student perception of value's outcomes

2.3.5. Future lines of research

This study exposes some gaps which need to be further addressed. Studies have investigated student perception of value in different learning approaches in HE; and the outcomes of student perceived value; however, some areas of potential investigation have been neglected:

Learning approaches in HE

More research efforts are needed to further the understanding the student perception of value in HE by applying different active learning approaches such as GBL, project-based learning, problem-based learning and so. Understanding the students' perception of value in HE by applying different active learning approaches would assist HEIs providing innovative and high quality learning approaches that fulfil the students' need and perceived value dynamically. In this sense, more call for proposal and papers would encourage development. Studies could then investigate transparent and clear documentation of the initial motivations, and outcomes of any approach to adopt participatory design that builds upon existing knowledge.

Determinants of student perception of value

A better understanding of the factors that affect student perception of value is needed. In particular, another implication of the study comes from the recent stream of research focused on the impact of the demographic impacts on student perception of value in HE. Greater discussion of the benefits and costs perceived by different ages, gender, and marital status.

Moreover, investigating how the behaviors of multinational partners in the different contexts, such as other countries, cultures, and religious is of extreme importance. With the increasing internationalization of HE, it is crucial to understand how different student perception of value dimensions are impacted by different cultures. There would be interesting insight into how perception of benefits and risk are affected by the different cultures, and what are the boundary conditions or moderating factors.

Outcomes of student perception of value in HE

The outcomes such as student satisfaction, evaluation assessment of the education provision received and word of mouth are still in its infancy. Thus, future research would focus on deep understanding of student perception of value's consequences in particularly different learning approaches.

2.3.6. Conclusions

It is apparent that perception of value in the educational context offers a means by which institutions can comprehend, manage and impact value among all stakeholder groups, as well as drive course design and strategic planning (Chung & McLarney 2000; Ng & Forbes 2009). This paper aims at presenting a systematic review of the literature about student perception of value.

The descriptive analysis results show that the majority of studies were published between 2010 and 2020, and mostly in higher education journals. These researches were located mostly in the USA and the UK. Most of the publications used quantitative research methodology and analysis the perception of value of the specific group of students.

The thematic analysis results show that value dimensions in HE are functional, social, epistemic, emotional and conditions. Although there are some factors which impact on students' value judgements such as university image, quality of services, student demography and culture, valence of students' experience, trust, student personal characteristic and personal value, and risk. Moreover, our analysis uncovered a number of student perception of value consequences. Student perception of value has impact on their satisfaction and loyalty, intention to offer positive or negative word of mouth recommendation. In this systematic literature review we identified that learning approaches impacting student perception of value in HE.

There are some clear implications for the university's positioning in the educational market. HEIs are in a position to innovate and create opportunities to deliver high-quality educational services.

Students' perceived value and trust are valuable and insightful for instructors to consider promoting student learning motivation. Although changing organizational culture is by far the most challenging managerial task, strong perception of values also makes up a valuable asset and therefore, if maintained, they should be enforced even more explicitly in all the activities in the university. In addition to the better positioning of a university in the educational market, a strong organizational identity would result in a higher commitment by the employees and students.

HEIs' enactments and activities influence students' perception of value. Quality of supervision provided by educators affects levels of student motivation and engagement with learning. This implies

that the more favorable the students' perception of the value, the higher the student's loyalty. Since service quality is strongly linked to value creation, this antecedent should be the first one considered. Our study suggests that trust in faculty has a positive effect on perceived value. This conveys that different employees will have a different impact on value perception, the role performed by the employees affects value perceptions. Students assess employees as tangible representations of the institution and interactions with them lead to important valuations about the institution. Efforts to enhance the relationship of the institution and faculty with the student can improve student satisfaction. Perceived value is a vital element for setting up a student loyalty platform. Educators' performance that enhances the levels of competence, integrity and dedication to students may affect students' overall level of trust. The managerial implication is that there is a need to minimize perceptions of sacrifice before students enroll on the program.

This work is not without limitations. First, it does not include all possible academic sources, but it is focused on major databases of scientific journals. Relevant knowledge might also come from investigations that are not included in the selected list, such as textbooks, working papers or editorial contributions. Second, the keywords could be enriched or modified to extend the coverage of potentially interesting articles. Moreover, some studies might utilize different labels of keywords to refer to student perception of value depending on the theoretical development, which constitutes the foundation of the study.

Section 4. Student Co-creation in Higher Education – A Systematic Literature Review

Abstract

As competition for student enrollment and funding among universities increases, higher education institutions (HEI) need to critically endeavor to implement and offer high quality service experiences. Drawing on current literature on student co-creation, this paper aims at presenting a systematic review of the literature on co-creation strategies in higher education (HE) in order to map extant research on this topic and offer a consolidated view of how co-creation may contribute to creating mutual value for institutions and students.

The findings of our review include a descriptive analysis of the body of papers and a thematic analysis structured under three themes; (1) co-creation strategies that can be used by HEI; (2) Co-creation barriers and benefits for HEIs; and (3) Co-creation barriers and benefits for students. We identify an exhaustive inventory of the strategies, barriers and benefits studied in extant literature. Finally, directions for further studies are identified.

Keywords: Antecedents, Benefits, Barriers, Strategies, Student Co-creation, Higher Education

2.4.1. Introduction

Following a marketing trend for improving customer engagement, it has been recommended that students are engaged as active co-creators of their university and learning experience (Bowden & D'Alessandro, 2011; Dusi & Huisman, 2020; Klemenčič, 2015). Students progressively have opportunities to take on proactive roles as consultants, student representatives, co-researchers (Bell *et al.*, 2009) or curriculum co-designers (Bovill *et al.*, 2016; Bovill *et al.*, 2011; Díaz-Méndez & Gummesson, 2012; Doyle *et al.*, 2019).

Such an active role enhances students' ability to become co-creators in their education process. Through this co-creation process, students' resources such as time, novel ideas and feedback are merged with organizational resources to foster a series of experiences and activities that promote interaction and exchange, and this in turn can prompt improved practice and innovation (Dollinger *et al.*, 2018) Students involved in co-creation bring their own perspectives, experiences, skills, and

knowledge to their own education process (Bovill, 2013).

Students and HEIs are driven by different motivating forces to improve student experience. On one hand, HEIs are motivated by a desire to find extra revenue (Dollinger *et al.*, 2018; Giner & Peralt Rillo, 2016), while students, on the other hand, demonstrate enthusiasm for taking a more active role in their HE experience (Bovill *et al.*, 2016), and enhanced persistence, learning, and achievement (Bryson, 2016). Since both HEIs and students have reasons to improve student experience, there are a number of approaches to help them cooperate towards this end.

Despite this increasing active role of students in their education co-creation, there is scarce evidence of the factors that fosters students' co-creation of value, as well as the benefits and barriers for HEIs and for students. Therefore, this paper aims at presenting a systematic review of the literature on the theme of co-creation strategies to map extant research on this topic and offer a consolidated view of how these strategies contribute to creating mutual value for HEIs and students. A literature review paper can serve as a platform for future research by explicitly synthesizing extant knowledge, identifying research gaps and suggesting promising directions for further research on a given topic in terms of methodology, theory, constructs/variables, and contexts (Paul & Criado, 2020; Tranfield *et al.*, 2003). The amount of existing research looking at co-creation in HE settings calls for such a comprehensive overview.

This paper is organized as follows: we start by presenting the concept of co-creation in HE, followed by method, results and discussion. We present the future lines of research in section five and implications and conclusions in section six.

2.4.2. Co-creation in Higher Education

Value co-creation has been conceptualized as a marketing and management strategy that integrates consumer resources to cooperatively co-create value. Value co-creation evolved from the shortcomings of the traditional producer-consumer relationship, in which suppliers provide value and consumers consume or destroy it (Vargo & Lusch, 2008). By adopting co-creation, organizations seek a mutual and well-balanced relationship with their consumers, thus enabling a broad personalization of services, products, and/or delivery (Prahalad & Ramaswamy, 2004a). The context of HE has also been witnessing this trend.

Dollinger *et al.* (2018) presented the conceptual model of value co-creation in HE. Their model incorporates key components of value co-creation, value-in-use (ViU) and co-production, and links to the anticipated advantages of value co-creation. According to Vargo and Lusch (2004), ViU is more than co-production, exchange, and possession of goods or services, and, applied to the context of HE, it entails that students figure out how to utilize, repair, and maintain a product or service proposition. Co-production suggests that students are involved in performing the different activities, including intellectual work of designing, resource aggregating and processing activities that lead to the creation of outputs (Etgar, 2008).

Verwoord (2016) adds that although students are not experts in the discipline, they have expertise in being students. Hence, they can make a significant contribution to improving practice. By providing students with greater latitude to share knowledge, universities can innovate their service while simultaneously avoiding future risks. Additionally, if the university offers assets such as a platform and detailed knowledge of prior production, the students can also provide feedback and novel ideas for innovation (Dollinger *et al.*, 2018). Progressively, the term ‘student experience’ has become centered around the manners in which students can proactively participate in HE and even assume customer-type roles. Moreover, students within HE have increasingly demonstrated interest in having the possibility of personalizing their experiences (Bryson, 2016).

In HE, the students’ relationship with their university can also influence their feelings towards their university and their HE experience by incorporating learning (Carini *et al.*, 2006). Additionally, students’ positive relationships with their university can contribute to creating a community (Zhao & Kuh, 2004) that may pave the way for future collaborations (Dollinger *et al.*, 2018). Personalization via ViU in HE may also allow for students to construct value propositions – e.g., degrees or courses – within their HE experience to fit their own needs or desires. Another component is customization, which can be supported with technologies that foster a wider scale of co-creation. Hence, there are multiple strategies that HEIs can use to allow students to actively engage in their HE experience. For example, recently, Xu *et al.* (2018) noted that the multiple roles of students incorporate “client”, “partner”, “co-producer”, “product”, and “citizen”.

Hence, it is important to identify the strategies that provide students with opportunities to co-create

value that is consistent with students' desire, and classifying the main motivational benefits for students and HEIs in co-creation of value.

2.4.3.Method

This study aims at conducting a systematic review of the literature on the topic of co-creation in HE. This approach is different from a conventional review, as it is focused, transparent, and allows research and specialist groups to be united, prompting overall synthesis (Thorpe *et al.*, 2005). A systematic review seeks to identify extant knowledge in a study subject and the most relevant gaps, leading to advancement of theory (Tranfield *et al.*, 2003). We focus on student co-creation strategies in HE. Utilizing the process used by Klewitz and Hansen (2014) and Seuring *et al.*, (2005), the systematic literature review consisted of a six-step procedure that includes the search process (steps 1 to 4) and the descriptive and thematic analyses (steps 5 and 6):

Step 1. Following the recommended practices for conducting systematic literature reviews (Paul & Criado, 2020), we started our review by establishing the following inclusion criteria: The domain of the research was operationalized through eight keywords: “Student”, “co-creation”, “cocreation”, “student co-creation”, “co-production”, “coproduction” “value in use”, and “higher education”. Although co-production is different from co-creation, some studies use co-creation and co-production interchangeably; thus, we use both concepts. The research was carried out without time limitations on December 2020. Target articles had to match at least one word.

Step 2. To guarantee quality and decrease the sample to a workable amount, this investigation focused on peer-reviewed academic journal papers written in English. The journals focusing on education, business, management, innovation and marketing were collected.

Steps 3 and 4. The research was conducted in the following significant research databases: Web of Science Core Collection, Google Scholar, and Scopus. Only papers published in journals focusing on education, business, management, innovation and marketing were collected. Our search resulted in an initial list of 398 articles. Our list was reduced to 277 relevant articles by eliminating repeated entries and papers in languages other than English.

These 277 papers were analyzed via an iterative process, focusing on the title, abstract, and pertinent

parts of the full text, aiming at identifying which papers presented a strong focus on student co-creation in HE. Then articles that were not directly linked with the subject were excluded. The final list, comprising 128 empirical and theoretical articles, was examined.

The analysis (steps 5 and 6) was organized into two sections: a quantitative descriptive analysis (bibliographical) for a general overview of the topic under research, followed by a qualitative thematic analysis to gain an in-depth perspective on the data.

Step 5. A number of categories that defined the articles were selected for the descriptive analyses, such as year of publication, journals, impact of the papers, countries of the studies, and research methods.

Step 6. The thematic analysis aimed to systematically categorize the papers' content and identify relationships and identify the main streams of research (Lane *et al.*, 2006; Paul & Criado, 2020). This synthesis procedure was deductive and interpretative.

2.4.4. Results and Discussion

We structure the results into descriptive and thematic analyses.

2.4.4.1. Descriptive analyses

The descriptive analysis is structured into the following topics: year of publication; journals; study location; research methods, and impact of the papers.

On what concerns year of publication, although the first paper that meets the inclusion criteria was published in 2009, the majority of researches were published after 2018 (Figure 2.4.1). This finding suggests a rising interest amongst scientists regarding the discussion of the topic of co-creation in HE in recent years, which may be due to increased awareness of the use of technological co-creation strategies in HE.

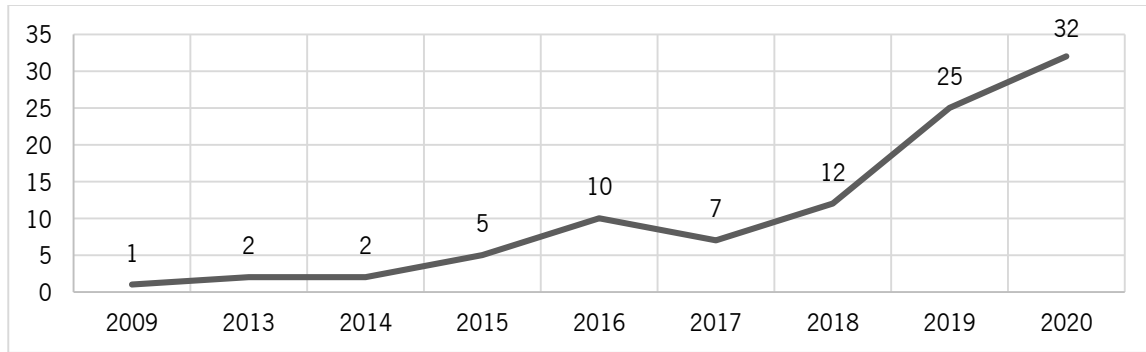


Figure 2.4.1. Distribution of articles by year of publication

The analysis additionally featured that student co-creation in HE research has been published in a wide variety of JCR-indexed educational journals with high impact factor such as Journal of Marketing for Higher Education (17 articles), Studies in Higher Education (6 articles), Higher Education (6 articles) that account for the highest number of papers. A variety of publication outlets focused on education and development are found.

Regarding study location, results show that the investigations focus on diverse countries, mostly the UK, the USA, Australia, and Malaysia. Most studies adopted a single-country focus (figure 2.4.2). This result shows to some extent the global appeal of the topic, however there is a need to diversify the national contexts where research is carried out and replicated.

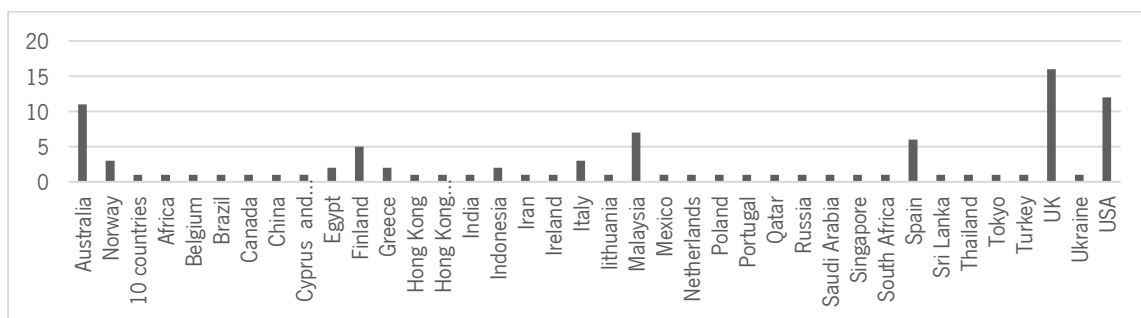


Figure 2.4.2. Studies by country of publication

On what concerns the methodology used in the papers, 56% of papers were quantitative, followed by 28% of qualitative research approaches, and 16% used mixed methodologies. The data collection methods used in quantitative studies include questionnaires, as well as evaluation, academic and cognitive tests, while in qualitative studies the methods utilized include interviews, case studies, observations, and focus groups. This result shows that a variety of research designs has been used to study co-creation in HE (Figure 2.4.3).

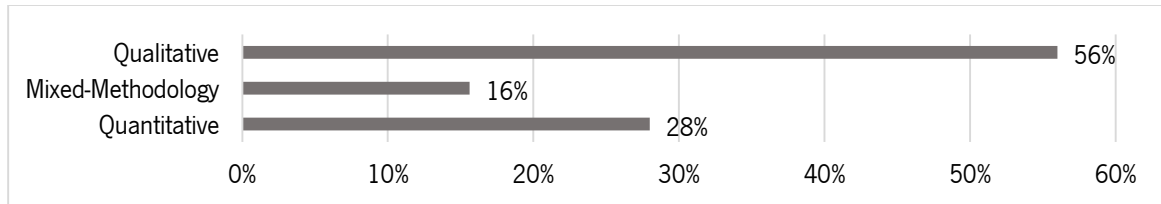


Figure 2.4.3. Studies methodological choice

We analyzed the number of citations received to understand the impact of these publications, and illustrate the ten most-cited articles with their sources and their highlights in Table 2.4.1.

Authors	Source title	Cited by	Study highlights
<i>McCulloch (2009)</i>	<i>Studies in Higher Education</i>	341	In this report, students, lecturers, and those who assist with the learning process are considered partners in a cooperative endeavor focused on producing, disseminating and applying knowledge.
<i>Radnor et al., (2014)</i>	<i>Public Management Review</i>	183	It presents an example in the context of HE where the creation of a model brought staff and students together to concentrate on the design of student enrolment, which resulted in enhanced student experience and supported coproduction.
<i>Duque (2013)</i>	<i>Total Quality Management and Business Excellence</i>	164	It presents a theoretical structure for analyzing student satisfaction, perceived learning outcomes, and dropout intentions, including energy dedicated to studying, active participation in student organizations, time spent on campus, and interaction with other students and faculty members.
<i>Elsharnouby, (2015)</i>	<i>Journal of Marketing for Higher Education</i>	101	It explores what student satisfaction with university experience and analyzes the impact of overall satisfaction with the university experience on student co-creation behavior, in particular participation behavior and citizenship behavior.
<i>Balaji and Sadeque (2016)</i>	<i>Journal of Business Research</i>	94	It examines the role of university identification in university supportive behaviors, namely university affiliation, advocacy intentions, suggestions for further improvement, and participation in future activities.
<i>Dollinger et al. (2018)</i>	<i>Journal of Marketing for Higher Education</i>	80	It presents the first conceptual model of value co-creation in HE, including critical components of value co-creation, co-production, and value-in-use, in addition to links to the benefits expected from value co-creation.
<i>Aspara et al. (2014)</i>	<i>Consumption Markets and Culture</i>	69	It conducts a study on a university in the process of rebranding itself according to a new logic that is market-oriented and service-dominant.
<i>Giner et al., (2016)</i>	<i>Journal of Computational and Applied Mathematics</i>	52	It empirically measures the impact of co-creation on the core marketing outcomes of student satisfaction, and the resulting loyalty.
<i>Foroudi et al. (2019)</i>	<i>Technological Forecasting and Social Change</i>	40	It analyzes the weight of student value co-creation behavior in a university's image and reputation, the vital role of university websites in engaging student value co-creation behavior, and the relevance of identifying different types of customer value co-creation behavior.
<i>Mostafa (2015)</i>	<i>Journal of Marketing Education</i>	39	It focuses on the concept of student social media engagement, and the nature of the nexus student social media engagement/perceived value.

Table 2.4.1. The five most-cited papers

Source: own elaboration

This descriptive analysis highlights the profile of the papers studied regarding when, where and how

the topic has been studied.

2.4.4.2. Thematic analysis

A thematic analysis was conducted to obtain a comprehensive view of the published works on the topic of student co-creation in the HE context. Using a deductive method, the selected articles were classified according to the following: (1) Co-creation strategies in HE; (2) Co-creation barriers and benefits for HEIs; and (3) Co-creation barriers and benefits for students. The result of this analysis is presented in the following sections.

2.4.4.2.1. Co-creation strategies in HE

Our analysis identified a diverse representation of co-creation strategies in HE: Electives provision, Crowdsourcing, Games, Student-university identification, Experience sharing/interaction through university website and online platforms, Work-integrated learning, and Educational program design (Figure 2.4.4 and Table 2.4.2).

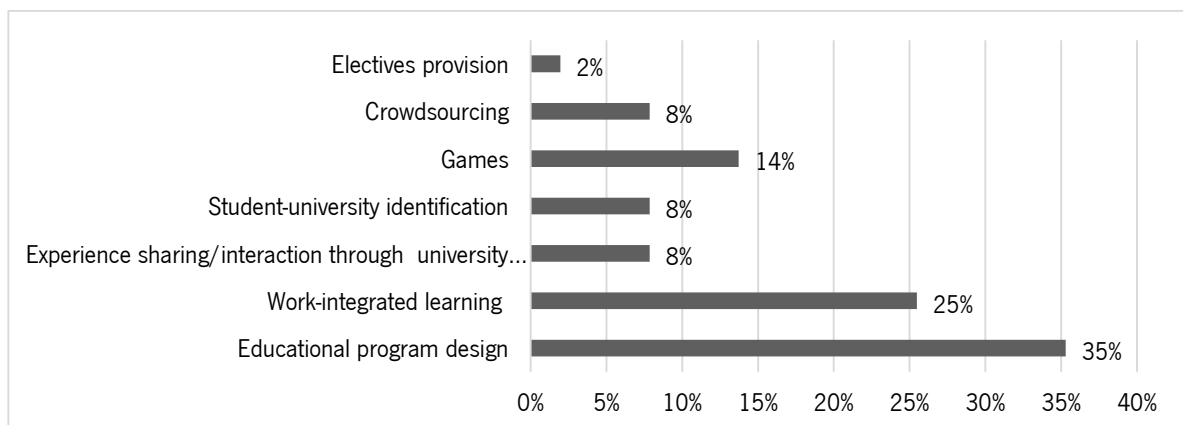


Figure 2.4.4. Co-creation strategies in HE

Electives provision

Students should choose what they want to learn and be provided with elective subject options, which represents a value-in-use (Dollinger & Lodge, 2019a), rather than following a mandatory course curriculum. This helps students to choose the subject they need for future careers and also helps HE institutions to identify their clients' needs.

Crowdsourcing

The crowdsourcing approach allows engaging a larger audience in co-creation. This production and distributed problem-solving model utilizes online technology to encourage clients to actively participate (Brabham, 2008). Often supporting user-generated ideas and suggestions, crowdsourcing can be applied via different methods and across different points of the value chain. Crowdsourcing is an easy way to collect data on students' perspectives and opinions via a mobile application and/or a website portal (Dollinger, 2018). Additionally, Sherwood (2020) indicates that all range of evaluations of student learning experiences, mainly in the form of storytelling when they describe their own experiences, are vital for the advancement of teaching and learning (methodologies/activities).

Games

Games and game-based learning has been highlighted by several studies as a strategy for student co-creation in HE. Sanina et al. (2020) clarified the digital simulation game as a re-enactment of a real-world system, phenomenon or procedure planned to foster the learning of academic content and created in the form of software or utilizing a digital platform. Pöyry-Lassila *et al.*, (2017)'s findings additionally highlight the potential of game design and development projects as explicit learning environments supporting intensive interaction and knowledge co-creation in HE.

Student-University Identification

The importance of student-university identification and university brand equity on student co-creation has been noted by Abdelmaaboud *et al.* (2020); Balaji *et al.* (2016); Eldegwy *et al.* (2018); Girard & Pinar (2020); Manzoor *et al.* (2020); Perera *et al.* (2020); Peruta & Shields (2018); Wilkins *et al.* (2016); and Wilkins *et al.* (2018).

University brand identification refers to students defining their own selves in terms of some association with their university brand (Eldegwy *et al.*, 2018). Balaji *et al.* (2016) characterize university identification as a sense of belongingness or oneness with an organization perceived by an individual. The authors indicate that individuals who are identified with the organization usually define themselves in relation to the organization and view the successes and failures of the organization as their own. The authors investigate the impact of student-university identification on different university-supportive behaviors such as advocacy intentions, suggestions for improvement, university affiliation, and participation in future activities.

Experience sharing/interaction through university website and online platforms

Many reviewed studies discuss university website and other online platforms for student co-creation such as Dollinger et al. (2018), Farhat et al. (2020), Foroudi *et al.* (2020), Foroudi *et al.*, (2019), and Voropai *et al.*, (2019). Foroudi *et al.* (2020) indicate that a university website is the front entrance for students and other partners. They examine how student value co-creation behavior contributes to university image and reputation, the importance of a university website in engaging student value co-creation behavior, and the significant role of identifying different types of customer value co-creation behavior (participation behavior and citizenship behavior). A university website can function as a first channel of contact for students to interact and co-create value for the university through other associated social networking sites. Voropai *et al.*, (2019) discuss how internet-based social platforms, such as Instagram, Facebook and Twitter, also offer a collaborative environment that empowers partners to gain and share knowledge. Moreover, communication tools such as social media and reviews utilized by the recruitment team allow students to share their university experiences via online social networks or review sections, which influence community behaviors and their decision making regarding their HE selection (Dollinger *et al.*, 2018; Voropai *et al.*, 2019).

Work-Integrated learning

As a curricular technique, Work-Integrated Learning (WIL) provides students with real professional experiences in workplaces or in the context of classroom-based projects, a truly co-operative education as part of their learning experience. Universities offer various WIL methods, namely short or long-term internships at local, regional, or international level, opportunities for students to participate in competitions mentored by business leaders or to engage in classroom-based projects centered on developing solutions to real challenges presented by workplace partners (Barbera *et al.*, 2017; Bovill *et al.*, 2016; Bryson, 2016; Doyle *et al.*, 2019; Fitch, 2011; David Fleischman *et al.*, 2019; Irick *et al.*, 2020; Membrillo-Hernández *et al.*, 2019; Muñoz-Escalona *et al.*, 2018; Ruskin & Bilous, 2019; Smith & Worsfold, 2014; Tari Kasnakoğlu & Mercan, 2020) Workplace partners can thus contribute to a critical component of student learning in WIL. The association's location, field of work, and culture provide the context for learning experiences (Ng *et al.*, 2009), or the unit structure comprising learning results and assessment tasks and expect students to co-design and create discipline content (Bovill, 2014; Ruskin & Bilous, 2019). Workplace partners and students foster the sustainability of the WIL

unit by assisting with deciding topics encompassed by the unit, and this in turn guarantees that the unit meets their needs.

Another WIL method such as multiple choice questions (MCQs) can bolster the procedure of formative assessment and feedback. Doyle *et al.*, (2019) indicate that co-creation can take an assortment of structures incorporating the involvement of students in the evaluation of both course content and learning and teaching processes; redesigning the content of courses; undertaking disciplinary research; researching learning and teaching; designing assessments (e.g., essay questions) or opting between different assessment methods; and grading both their work own and others' (Bovill *et al.*, 2016).

Educational program design

Educational program design fosters co-creation and includes partnerships between students and universities participating in an educational program design such as: workshops, implementing a curriculum design team to write or refine a unit guide, designing the learning environment, designing short animated videos, designing content, designing of the web-based solution, working as peer mentors.

A possible partnership between students and university staff could include inviting a group of students to participate as paid consultants in educational program design workshops (Bovill, 2014). Input by students occurs during the workshop, and university staff are responsible for designing the curriculum resulting from such student input. Student perspective can be utilized to empower future students to make their contribution to the program (Cook-Sather, Des-Ogugua, & Bahti, 2018; Dollinger & Vanderlelie, 2020; Jukema *et al.*, 2019; Könings *et al.*, 2020; Ruskin & Bilous, 2019). Additionally, students produce YouTube videos or podcasts as curricular-based learning resources (Bovill, 2019; Cook-Sather, 2014; Keegan & Bell, 2011; Kneale, 2018; Lee *et al.*, 2008; Lubicz-Nawrocka & Simoni, 2018; Murphy *et al.*, 2017; Perello-Marín *et al.*, 2018) students may design a novel online learning space by incorporating case studies, as well as written, audio and video resources that first-year students can benefit from (Bovill *et al.*, 2011). Dollinger et al. (2019) explain and compare differentiated approaches of human-centered design via an analysis of participatory contexts in Learning Activities (co-design, co-creation). These strategies can be delivered through different

technological platforms.

Strategies	Platforms strategies	References
Electives provision	Elective subject options	<i>(Dollinger and Lodge, 2019)</i>
Crowdsourcing	Mobile application and/or a website portal	<i>(Dollinger, M, 2018), (Taylor et al., 2015), (Sherwood, 2020), (Sutarso et al., 2017), and (John-Matthews et al., 2020)</i>
Games	<ul style="list-style-type: none"> • An assorted series of computer-based education applications • Educational software • Educational computer games • Mobile learning games • Educational networks • Digital simulation games • Online courses • Marketing “hooks,” or short in-class exercises • Massive open online courses (MOOCS) • Open Badges • CritIQ, a Mobile Critique App for Undergraduate Communication Design Learners • Business Product Owner (BPO) 	<i>(Molin, 2017), (Dollinger et al., 2018), (Taylor et al., 2015), (Sherwood, 2020), (Sutarso et al., 2017), (Fang, Hwang, & Chang, 2019), (Qi, Zhang, & Zhang, 2020), (Pöyry-Lassila et al., 2017), (Sanina et al., 2020), (Magnotta et al., 2020), (Zhang et al., 2020), (Kuhmonen, Seppälä, Anttila, & Rantanen, 2019), (Lim, Shelley, & Heo, 2019), (Vidakis et al., 2019), (Kuhmonen, Pöyry-Lassila, & Seppälä, 2018), (Antoniou & Bamidis, 2018), (Wong Kung Fong, 2013), and (Baham, 2020)</i>
Student-university identification	<ul style="list-style-type: none"> • University Social Augmenters’ Brand Equity (USABE) • Social Brand Engagement (SBE) • Consumer-based brand equity (CBBE) 	<i>(Wilkins et al., 2018), (Wilkins et al., 2016), (Bhattacharya and Sen, 2003), (Eldegwy et al., 2018), (Balaji et al., 2016), (Perera et al., 2020), (Peruta & Shields, 2018), (Girard & Pinar, 2020), (Manzoor et al., 2020), (Abdelmaaboud, Peña, & Mahrous, 2020), and (Aspara et al., 2014)</i>
Experience sharing/interaction through University website and social media platforms	University website and Social media (Facebook, Twitter, Instagram)	<i>(Hoyer et al., 2010), (Foroudi et al., 2019), (Voropai et al., 2019), (Dollinger, M, 2018), (Farhat et al., 2020), and (Mostafa, 2015)</i>
Work-integrated learning (WIL)	<ul style="list-style-type: none"> • Short or long-term internships at local, regional or international level • Gold Standard Project Based Learning (GSPBL) • Tec21 Educational Model, Multiple choice questions (MCQs) • Self-generated exam activity, Solving real-life challenges for the businesses and subsequently • Project-based learning (PBL) • Third-party community engagement experiences (TPCE) • International service learning; ISL • university–student–community engagement (U–S–CE) • Timescapes in interdisciplinary projects • Participatory action research (PAR) • Technology Enhanced Learning (TEL) • Wicked problems-based learning • Startup BusinessLab 	<i>(Ruskin & Bilous, 2019), (Catherine Bovill, 2014), (Membrillo-Hernández et al., 2019), (Doyle, Buckley, & Whelan, 2019), (C. Bovill et al., 2016), (Muñoz-Escalona, Savage, Conway, & McLaren, 2018), (Dollinger & Lodge, 2019b), (Vespestad & Smørvik, 2019), (Pee, 2019), (Ho, A, 2020), (Chemi and Krogh, 2017), (Bowden & D’Alessandro, 2011), (Irick et al., 2020), (David Fleischman et al., 2019) (Perello-Marin et al., 2018), (Barbera et al., 2017), (Burford, M. R., & Chan, K., 2017), (Hamby & Brinberg, 2016), (Diaz et al., 2016), (Bowie & Cassim, 2016), (Sugino et al., 2016), (David Fleischman, Raciti, & Lawley, 2015), (De Eyto, 2014), (Wallin, 2020), (Davis & Pamenter, 2020), (Brook, Leanne Aitken, MacLaren, & Salmon, 2020), (I. C. Elliott, Robson, & Dudau, 2020), (Best, Koski, Walsh, & Vuokila-Oikkonen, 2019), (Antoniou & Bamidis, 2018), (Hiedemann, Nasi, & Saporito, 2017), (S. Galloway & Edwards, 2017), (Radnor et al., 2014), (Kleczeck, Hajdas, & Wrona, 2020), (Mononen, Kortelainen, & Hellgrén, 2016), and (Nuebel, Nowinski, Hemmis, & Lindsley, 2020)</i>

Educational program design	<ul style="list-style-type: none"> • Educational program design workshops • A curriculum design team • Designing learning environment • Producing podcasts/YouTube as curricular learning resources • Short animated videos • Peer-Assisted Learning (PAL) • Pilot project • Submitting pictures and articles to magazines • Student Relationship Engagement System (SRES) • COLABS • AMEE Guide No.138 • Living Lab Applied Gerontology 	<p>(Catherine Bovill, 2014), (Bergmark & Westman, 2016), (Ruskin & Bilous, 2019), (Könings, Bovill, & Woolner, 2017), (Catherine Bovill, 2013), (Fraser & Bosanquet, 2006), (Catherine Bovill et al., 2011), (Doyle, Buckley, & Whelan, 2019), (C. Bovill et al., 2016), (Garland, Khan, & O’Kane, 2015), (Celuch, Bačić, Chen, Maier-Lytle, & Smothers, 2018), (Keegan & Bell, 2011), (Lee et al., 2008), (Loch & Lamborn, 2016), (Dollinger et al., 2019), (Parkes, Benkwitz, Bardy & Myler, and Peters, 2020), (Catherine Bovill, 2019), (Cook-Sather, 2014), (Lubicz-Nawrocka & Simoni, 2018), (Murphy et al., 2017), (Dollinger & Vanderlelie, 2020), (Könings et al., 2020), (Jukema et al., 2019), (Kneale, 2018), and (Perello-Marín et al., 2018)</p>
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Table 2.4.2. Co-creation platform strategies in HE

Source: own elaboration

2.4.4.2.2. Co-creation Benefits and Barriers for Higher Education Institutions

Our analysis identified a number of perceived co-creation benefits from the institutions’ perspective, including pedagogical, reputational, brand love and positive word of mouth regarding the curriculum design process (Bovill, 2014; Ribes-Giner *et al.*, 2016; Sahi *et al.*, 2019). Students create emotional bonds with service providers/brands and also participate in brand building via close involvement and positive feedback.

Other advantages of co-creation for HE institutions are enhanced teaching and classroom experiences; increased meta-cognitive awareness and a more robust sense of identity; improved student-staff relationships and the implementation of a series of graduate attributes (Bryson, 2016; Muramallaa & Alqahtanib, 2019). According to Robinson and Celuch (2016), customer orientation is a highly significant and critical priority for universities, for it can positively impact relational outcomes associated with student commitment, retention, and positive word of mouth. Celuch *et al.*, (2018) and Hasan and Rahman (2016) indicate that utilizing online platforms for student co-creation will help HEIs and other service sectors to both achieve better global market positioning and to differentiate themselves among other competitors.

Moreover, some scientists have pointed out that the procedures are continually being co-created as students or clients bring their own resources and actions to learning environments or platforms. Roberts and Alpert (2010) mention that active engagement provides inestimable feedback, stronger

business relationships and a minimized risk to the business as clients (students) are engaged in solving problems (Gibbs & Kharouf, 2020). “The anticipated benefits for institutions are student loyalty, university image, and student university identification” Dollinger et al. (2018, p. 224). Student participation benefits for the university include better services and enhanced university marketing (Fagerstrøm & Ghinea, 2013; Fluckiger *et al.*, 2010). Sahi et al. (2019) believe that the relationship between universities and students would boost university brand survival (Azoury *et al.*, 2014). Specifically, social co-creation processes via web-based collaborations foster increased market acceptance of HEIs while decreasing market risk (Hoyer *et al.*, 2010).

Our analysis also identified a number of barriers: risks of poor task performance by unskilled customers, exposure to opportunism by associated partners, and potential social stigmas related to the performance of some tasks. Some co-creation activities require physical effort and older students or individuals with health issues may find them too strenuous. Students on the verge of engaging in co-creation activities may also guard against the psychological effort implied in the act of making decisions, learning new skills, and searching for information in an active way (Alioon *et al.*, 2012; Chen *et al.*, 2010; Pöyry-Lassila *et al.*, 2017; Rashid & Asghar, 2016) Lastly, co-creation may require students to make cultural and behavioral adjustments (Etgar, 2008; Junco, 2012; Kelley *et al.*, 1990; Monavarifard *et al.*, 2019; Salaber, 2014).

2.4.4.2.3.Co-creation benefits and barriers for students

Finally, our analysis identified a number of perceived benefits of co-creation from the students' perspective. Bond (2020) mentions that co-creation improves student persistence, achievement and retention. Bryson (2016) investigated the incorporation of a personal learning platform via “Students as Partners” activity and found that it resulted in increased student engagement and generated unanticipated benefits for students from their reflections about their own experiences. This suggests that co-creation influences reinforcement and shared emotional connection (Love & Crough, 2019). The positive effect of collaborative participation on co-creation includes:

Improving Learning Skills

Some of the authors indicate that one of the advantages of co-creation in HE is improving the learning

skills – for instance, Hounsell and colleagues indicate that co-creation develops personal and lifelong learning skills and improves learning (Bryson, 2016). Co-creation in HE encourages active learning; evidence suggests that students co-creating curricula are not just effectively learning, but also transforming their perspectives about learning (Bovill, 2013). Moreover, it contributes positively to student self-regulated learning and increasing ownership of learning (Love & Crough, 2019), and learning flexibility (Bowden & D'Alessandro, 2011; Ribes-Giner *et al.*, 2016). According to Hussain (2012), students are improving their learning skills and taking more personal responsibility for achieving their learning goals due to their engagement in a highly motivating learning environment. Duque (2013) expects that involvement of student in co-creation affects their cognitive learning outcomes. The points of co-created curricular procedures assume that there are various ways to learn and to teach.

Utilizing technology in co-creation strategies in HE can make instructing and learning processes more vigorous, enhance student personal efficacy and self-regulation (Alioon & Delialioğlu, 2019; Bond *et al.*, 2020; Bouta *et al.*, 2012). For example, game-based learning seems to substantially enhance learning performance and achievement (Akçayır & Akçayır, 2018) and active learning within the classroom (Bond, 2020). Sanina *et al.* (2020) also accept that simulations and games foster enhanced engagement in the learning procedure, facilitate the assimilation of classroom information and knowledge in a friendlier way for students, and provide opportunities to exercise skills that are impossible to practice in reality. It is pointed out that students can also create pertinent games to facilitate their learning, and the co-creative procedure is considered a powerful tool to promote communication, student creativity, and effective group dynamics. The utilization of digital simulation games provides students both with a risk-free environment and instant feedback on actions taken by the players involved. Co-creation enhances student engagement and involvement in the learning process by making them a valuable part of the instructional procedure (Blau & Shamir-Inbal, 2017).

Enjoyment and Enthusiasm

There are numerous reports of improved student motivation in co-creation environment in HE (Bovill, 2013, 2014; Bryson, 2016; Celuch *et al.*, 2018; Dollinger & Lodge, 2019a; Hounsell *et al.*, 2007; Könings *et al.*, 2020; Love & Crough, 2019; Sahi *et al.*, 2019). Meanwhile, students often grow in confidence through taking more responsibility for designing their own learning experience and many

authors assumed that it enhances student enjoyment and enthusiasm. Students are happy, and they are enjoying learning in a collaborative environment because of the friendly and co-operative learning environment (Bovill, 2013, 2014; Bovill *et al.*, 2011; Celuch *et al.*, 2018; Dollinger & Lodge, 2019a; Hounsell *et al.*, 2007; Hussain, 2012; Muramallaa & Alqahtanib, 2019; Sahi *et al.*, 2019; Sanina *et al.*, 2020). Students enjoy the 'social' value provided by HEIs (Cavallone *et al.*, 2020; Nguyen Hau & Thuy, 2016).

Deeper Understanding of Subject

Co-creation advantages for HE include the development of shared understanding. Recent studies have provided evidence that student co-creation fosters deeper subject awareness and greater comprehension of knowledge (Bovill, 2014; Bovill *et al.*, 2011). Sahi *et al.* (2019) and Sanina *et al.* (2020) indicate that students actively engaged in their learning can improve their critical reasoning, and students also have opportunities to incorporate their identity, beliefs, and social interactions into their learning process (Bovill *et al.*, 2011; Dollinger & Mercer-Mapstone, 2019).

Self-Awareness and Self-Efficiency

According to Sanina *et al.* (2020, p.3), "co-creation makes students equal subjects in the educational process by enhancing their self-awareness". The engagement of students in curriculum design at classroom level and program level can boost student confidence, sense of belonging and evaluation (Ogunmokun *et al.*, 2020). As Fagerström and Ghinea, (2013) and Fluckiger *et al.*, (2010) indicate, student benefits include enhanced student employability, confidence, and self-efficacy (Dollinger and Lodge, 2019a). WIL experiences, for instance, allow students to assimilate a variety of technical skills such as working with data analytics tools and competencies such as self-management and self-awareness (Jackson, 2015). The value of educational services contributions to the personal and professional advancement of students (Brooks & Everett, 2009). Additionally, co-creation and student partnership in HE communicate and exceed high expectations, and honor different talents and multiple ways of learning. Having high expectations will be a self-fulfilling prophecy (Bovill, 2013; Love & Crough, 2019). In the context of Higher Education, it is critical to boost communication among students, teachers, staff and the wider community, always aiming at improving learning experiences (Pinar *et al.*, 2011).

Better Opportunities in the Labor Market

Co-creation of knowledge can enhance student knowledge and skills (Fagerstrøm & Ghinea, 2013; Ribes-Giner *et al.*, 2016; Yeo, 2009). According to Celuch *et al.*, (2018), students engaged in co-creation are provided with opportunities to work with a professional team, to evaluate their level of skills (Seale *et al.*, 2015), and trust that their opinions are respected and valued (Cook-Sather *et al.*, 2018), such as to creativity, presentation skills, critical thinking and problem-solving skills, and teamwork (Celuch *et al.*, 2018). Co-creation also focuses on giving students prompt feedback and suggestions for ways to improve their execution (Bovill, 2013).

The labor market offers better opportunities to students who have been involved in co-creation as they have a better understanding of their efforts and the significance of what they are working on. They develop competencies, such as negotiation (Bovill *et al.*, 2011) and cooperation (Bergmark & Westman, 2016) that may foster career advancement (Ruskin & Bilous, 2019). Cavallone *et al.* (2020) and Sanina *et al.* (2020) highlight that digital simulation games assist in training a series of crucial skills such as analytical and strategic skills, self-monitoring, problem-solving skills, as well as social skills such as collaboration, teamwork, group decision-making skills, negotiation, interpersonal communication, knowledge sharing.

Our analysis also identified a number of barriers: according to Etgar (2008), perceived risks incorporate physical (bodily harm), financial (the risk of financial loss or risk of product received needing to be repaired or left unused), psychological and social (product consumption may negatively impact customer self-esteem or the way they are perceived by others, brands and providers experiencing reduced freedom of choice from associating with particular production partners), performance (when a product or a brand fails to perform as expected and does not deliver the promised benefits), and time-related risks (consumer's time may be lost in purchasing the wrong product). During co-creation in HE, students might feel uneasiness in some partnership relationships (Cook-Sather & Luz, 2015; Mercer-Mapstone *et al.*, 2017), experience role unsureness (Lizzio & Wilson, 2009), and uncertainty regarding their possible contribution, lack of time (Bovill *et al.*, 2011), the question of assessment (Meer & Chapman, 2014), and power imbalances (Mercer-Mapstone *et al.*, 2017).

In sum, our analysis exposed a quantity of co-creation strategies that can be used by HEIs, such as Choice providing, Crowdsourcing, Games, Student-university identification, Experience sharing/interaction through university website and online platforms, Work-integrated learning, and Educational program design. Figure 2.4.5. summarizes the findings of this study.

Our analysis identified a number of perceived benefits of co-creation from the institutions' point of view, including pedagogical, financial and brand equity. Student co-creation in HE enhances university reputation, brand love and student positive word of mouth. The curriculum design process, teaching and classroom experiences are positively impacted through student high involvement in co-creation process and their feedback. HE's brand equity such as awareness and a stronger sense of identity, longer business relationships university image, and student university identification are enhanced through student-staff relationships and being seen as customer-oriented. However co-creation causes some barriers for HEIs mainly age, disabilities, psychological problems cultural and behavioral adjustments of student or individuals prevent co-creation or decrease the co-creation possibility.

In what concerns the students' perspective, the following perceived benefits of co-creation have been identified: improving their learning skills, enjoyment and enthusiasm, deeper understanding of subject, self-awareness and self-efficiency, better opportunities in the labor market. The co-creation barriers that identified for the analyses are included: physical, financial, psychological, social, time and performance risks. In the following section we are presenting the future lines of research.

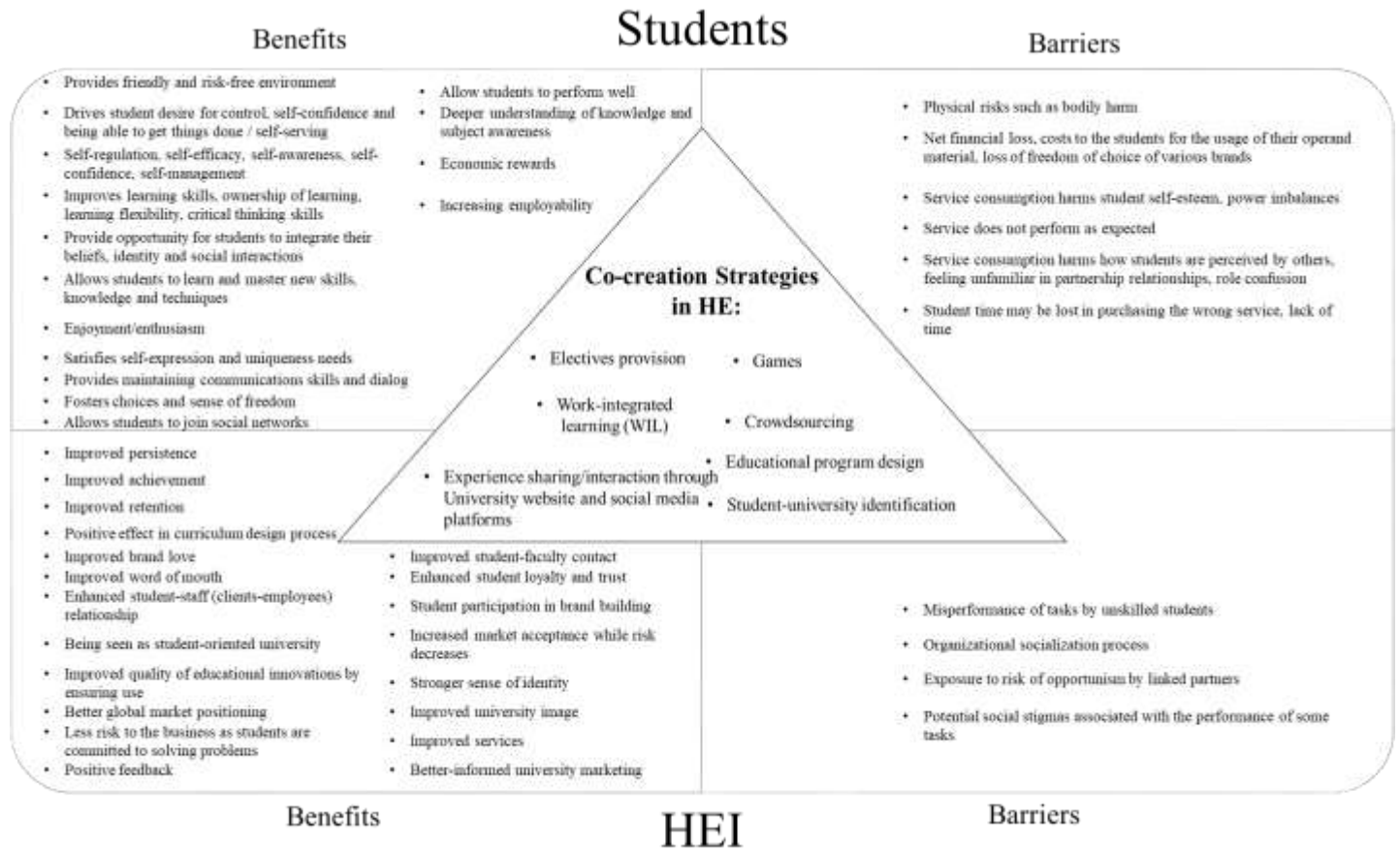


Figure 2.4.5. Map of extant research of student co-creation in HE

2.4.5. Future lines of research

Based on our analyses, we can point to a number of gaps which need to be further addressed. Studies have investigated how co-creation in HE can advance the development of resources; however, there some areas of potential investigation that have been left unattended:

Co-creation approaches in HE

Further research efforts must be directed towards understanding co-creation approaches (student co-creation behaviors and roles) in HE regarding every facet analyzed in this review. In this sense, more calls for research would encourage development of the field. Studies could then investigate initial motivations to engage in co-creation (both from the students perspective as well as HEIs), process, and results of any approach in order to subsequently adopt participatory design founded on extant knowledge.

Impact and measurement of co-creation in HE performance and outcomes

The analysis of the measurement of co-creation in HE performance and other outcomes such as student satisfaction and perceived value and employability is still in its early stages. Despite models and processes of analysis having been proposed by some scholars, the issue of measuring effectiveness of co-creation in HEI remains and increased research efforts are called for. This question is of paramount importance for practitioners and academics, as it may contribute to boosting the performance of co-creation in HEIs and the commitment of HEIs to co-creation practices. Future studies could focus on the relationship between brand attitudes and its results, such as negative word of mouth, and on advancing employability development and comprehending the potential for new power dynamics.

Technology and innovation impacts on co-creation in HE

The recent flow of research papers focused on the impact of technology and innovation on co-creation (Antoniou & Bamidis, 2018) in HE is yet another implication of this study. There is a need for an in-depth discussion of the benefits derived from participatory strategies can bring, especially regarding issues with large-scale adoption and continued usage, are needed, such as how can be existing technology advance well-established learning strategies such as choice providing, cooperative learning (Baumber *et al.*, 2020) etc.

The influence of culture and background on co-creation in HE

Investigating how the behaviors of multinational partners in the different contexts, such as other countries, cultures, off-campus, housing, library and religious services at the universities, is of extreme importance. As Abdelmaaboud *et al.* (2020) suggest to improve the generalizability of the results, future studies might apply this approach in more individualistic societies and examine its applicability across cultures. With the increasing internationalization of HE, it is crucial to understand how co-creation strategies are impacted by different cultures. In this vein, future research could explore how individual behavior (such as supportive intentions and complaining) is influenced by cognitive dissonance and satisfaction/dissatisfaction,; what is the faculty, governing bodies, employees, alumni and staff or industries opinion about the co-creation process (Gkogkidis & Dacre, 2020); integrate

antecedents, such as ethical values and culture , as they may provide relevant insight into how benefits and barriers are affected by the different cultures; and what are the boundary conditions or moderating factors in student the co-creation process.

2.4.6. Implication and Conclusions

Universities are under more pressure than ever before to attract and retain students. Consequently, a large number of universities are improving outdated marketing tactics in order to provide holistic student experiences. The findings imply that for a better marketing strategy, we think that the co-creation concept can be applied in HE with effectiveness. It provides multifaceted roles for students and may foster a more profound comprehension/characterization of their experience in all its complexity. Since brand positioning is identified as a co-creation benefit for HEIs in this study, HEIs should be aware of students' intentions or needs for getting involved in different co-creation activities. While some students may get involved in curriculum co-designing activities for personal reasons (such as fun, enjoyment, interest, and experience), others may participate for external reasons (such as gaining peer recognition, promotion, social identification, and rewards). HEIs' must understand such dynamics in order to devise an effective strategy. Furthermore, HEI should develop or implement various co-creation strategies that enhance student's perceived competence. The more confident students are in their talents, the more likely they are to actively engage in their co-creator role.

The role of students has evolved from passive attendance to active participation as they themselves shape the learning experience and determine the outcome. Universities ought to determine how to support a student in value creation by providing opportunities for value co-creation in alignment with the students' desire. This study identifies the benefits and barriers of co-creation for HEI's and students. Starting from 398 articles that were identified via a keyword search, 128 central journal articles have undergone a systematic review using qualitative and quantitative analysis methods. The descriptive analysis results show that the majority of studies were published after 2018, and mostly in higher education journals. These researches were located mostly in the USA, the UK and Malaysia. The descriptive analysis demonstrated that the number of published articles is still quite modest, and there is a need for increased commitment by academics.

Although there are some barriers to co-creation, the analysis identified motivational and educational benefits for students and pedagogical and competitive benefits for HEIs. Moreover, our analysis uncovered a number of co-creation strategies that can be used by HEIs, namely Choice providing, Crowdsourcing, Games, Student-university identification, Experience sharing/interaction through university website and online platforms, Work-integrated learning, and Educational program design. Hence, there is a variety of ways that HEIs can use in fostering co-creation and allowing students to engage as active actors in their education process.

Future research directions are proposed based on our analysis of extant research.

This work is not without limitations. First, not all possible academic sources were contemplated in our systematic literature review, which focused on the databases of leading scientific publications. Important information might also be found in investigations not covered in the selected list, e.g., textbooks, conference proceedings, editorial contributions or working papers. Second, other keywords could be used to encompass articles of potential interest. Moreover, some studies might utilize different keywords to reference co-creation contingent on the development of the theoretical framework that upholds our study.

Section 5. Students roles and behaviors in Higher Education co-creation -A Systematic Literature Review

Abstract:

Purpose: In today's global and highly competitive climate among universities, educational developers and instructors have focused more on trying to make the student experience more engaging. In this manner, student co-creation activities have recently become a major research priority in marketing and higher education (HE) research. The purpose of this study is to present a systematic review of the literature on student co-creation roles and behaviors in HE in order to map extant research on this topic and offer a consolidated view of the co-creation process and approaches that can be employed by HEIs to motivate students to co-create their HE experience.

Design/methodology/approach: A Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) approach was followed to classify, select, synthesize, analyze and assess the most relevant studies on student participation in co-creation in HE.

Findings: Our analysis has identified that the co-creation process in HE includes dialogue, access, risk and transparency. The main approaches used by higher education institutions (HEIs) to motivate students to co-create their HE experience are student involvement, cognitive engagement, university affiliation and emotional engagement. Our review also shows that student co-creation behaviors are mainly participation and citizenship behavior, and their co-creation roles include those of co-producers, participants, change agents and partners.

Originality: This systematic literature review analyses and critically discusses the state of the art on student co-creation roles in HE and the approaches HEIs use. By providing a map of existing research, the paper contributes both to the clarification of student co-creation roles and behaviors in HE and the identification of research gaps and opportunities for further research.

Key words: *Co-creation, Co-production, Value in use, Student, Higher education*

2.5.1. Introduction

Recent developments in higher education (HE), such as growing competition in the university sector, budget reductions, increased quality standards, decreasing demand, as well as students becoming

more demanding and having to compete in a more competitive job market, call for a re-evaluation of university marketing strategies (Díaz *et al.*, 2016). Therefore, higher education institutions (HEIs) need to consider the variables that improve experiences and higher student loyalty rates (Giner & Peralt Rillo, 2016). Being perceived as (more) customer-oriented is an increasingly essential strategic priority for most HEIs. Co-creation can provide a competitive advantage by offering innovative customer-designed services (Witell *et al.*, 2011). Co-creation is a process whereby students' resources are integrated with organizational resources to facilitate a range of activities and experiences that encourage exchange and interaction, which in turn can prompt improved practice and innovation (Dollinger *et al.*, 2018) and can enhance students' ability to take on an active role in their education process. Despite the lack of consensus of what constitutes teaching excellence, it involves allowing students to play an active role in their learning journey (Johnson, 2021). This study is the first systematic literature review that maps extant research on student co-creation roles and behaviors, and provides a combined view of the co-creation process and the approaches used to allow students to play those roles and co-create behaviors.

Although value co-creation has been applied in HE for some years now (Díaz-Méndez & Gummesson, 2012; Navarro-García *et al.*, 2014; Elsharnouby, 2015), there is no unanimous conceptual co-creation framework in HE. The literature on student engagement and student co-creation has made significant progress in comprehending and integrating the student into the academic aspects of the HE experience (Robinson & Celuch, 2016); hence, it is crucial to provide a systematic view of the multifaceted roles and behaviours that students can play in co-creation processes.

This systematic literature review aims to analyze and critically discuss student participation in co-creation in HE through the following research question: "What roles and behaviors are performed by students in co-creation in HE?" The purpose of this review is to contribute to a clear picture of the participation of students in co-creation in HE, thus contributing to the state of the art by mapping extant research on this topic.

2.5.2. Co-creation in HE

According to Elsharnouby and Mahrous (2015), the role of clients in shaping service experience and determining service outcome has changed from a passive audience to an active player/participant.

Several authors have called for a re-evaluation of student and instructor roles in HE so that students can become more involved and actively participate in the teaching and learning process (Brady, 2013; Cook-Sather, 2014). Dollinger *et al.* (2018) presented the first conceptual model of value co-creation in HE. They present the key components of value co-creation, value-in-use (ViU) and co-production, as well as the anticipated advantages of value co-creation. While there are several examples and extensive discussion in the literature of partnership and co-creation projects involving students, there are comparatively few studies that identify applicable co-creation approaches and student's co-creation roles and behaviors in learning and teaching in HE (Bovill, 2020). Ranjan and Read (2016) used the Vargo and Lusch (2004) service-dominant logic (SDL) approach to measure Value Co-Creation (VCC) using two dimensions: co-production and Value in Use (ViU). Vargo and Lusch (2006) differentiate between co-creation of value, which takes place in the usage/consumption stage, and co-production, which can take place in the production phase. ViU is derived from the client's usage context and procedures, including time, location, or uncertain conditions, unique experience, stories, perception, symbols, and social effect (Gummerus & Pihlström, 2011; Vargo & Lusch, 2004). ViU is the client's experiential assessment of the item or service proposition beyond its functional attributes and in accordance with their individual inspiration, specialized competencies, actions, and procedures (Ranjan & Read, 2016). Co-production is described by Ostrom (1996) as a process by which people who are not in the same organization contribute with inputs that are used to produce a good or service. This refers not only to participation, but also to a greater degree of interaction and cooperation between service providers and consumers (Elliott *et al.*, 2020).

The concept of students as co-producers in their learning process has been discussed in the educational literature (Mavondo *et al.*, 2004; Ng & Forbes, 2009). Students who see themselves as co-producers "take full responsibility for their learning and use teachers and other resources to help them succeed" (Mavondo *et al.*, 2004, p. 46), bringing their own perspectives, experiences, skills, and knowledge to their own activity (Bovill, 2013). Despite the fact that co-production is not the same as co-creation, some studies use co-creation and co-production interchangeably, and thus we will focus on both concepts.

In HE context, the value in the co-creation process can happen both in co-production (how students contribute to the design, procedures, or implementation of the activity) and in ViU (how

students/teaching staff create value for themselves through the activity) (Dollinger & Lodge, 2019a). Students progressively have opportunities to take on proactive roles as consultants, student representatives, co-researchers (Bell *et al.*, 2009) or curriculum co-designers (Bovill *et al.*, 2016; Bovill, 2019; Bovill *et al.*, 2011; Díaz-Méndez & Gummesson, 2012). As Dollinger *et al.* (2018) noted, while students are not disciplinary experts, they are experts at being students, and therefore have the necessary ability and knowledge frame to contribute meaningfully to the advancement of practice. If universities allow students to share knowledge more freely, this may help them innovate their service while avoiding future risks. Moreover, students can provide assets such as feedback and novel ideas for innovation. In HE, personalization through ViU would also allow for students to piece together value propositions, such as degrees or courses, within their HE experience to suit their own needs or desires. Students' relationship with their university can similarly influence their feelings towards their university and their HE experiences (Carini *et al.*, 2006). Students' positive relationships with their university can additionally create a community (Zhao & Kuh, 2004) that may give rise to future collaborative behavior.

2.5.3. Method

This study adopts a systematic literature review on student co-creation in HE related research. A systematic analysis aims to define extant knowledge on a study subject and identify the most relevant gaps, contributing to the development of the theory (Paul & Criado, 2020). The Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) approach was followed to classify, select, synthesize, analyse and assess the most relevant studies (Moher *et al.*, 2009).

The search for papers was conducted in two electronic databases, namely Web of Science (Web of Knowledge/Clarivate analytics) and Scopus. The search parameters were focused on international peer-reviewed academic journals and conference papers written in English, therefore excluding forewords, books and book chapters. The records were gathered using the search terms "student", "co-creation", "cocreation", "co-production", "coproduction", "value in use" and "higher education" in the title, abstract and keywords. Target articles were required to fit at least one term. The research was carried out without time limitations (Figure 2.5.1).

As a first step, the papers were screened and repeated entries were excluded, leading to the

identification of 275 studies. Then the topic and abstract were read to check eligibility, and those that were not directly linked with the subject nor published in English were excluded (n= 109). In addition, 38 papers were excluded on the basis of relevance. A total of 128 papers were retained for further analysis.

For each individual study, the following information was selected in the database: a) Author; b) Year; c) Title d) Source title; e) Type of paper; and f) Cited by and retrieved. The next stage involved a qualitative content analysis. The purpose of the thematic analysis was to systematically categorize the content of the papers and identify relationships (Lane et al., 2006).

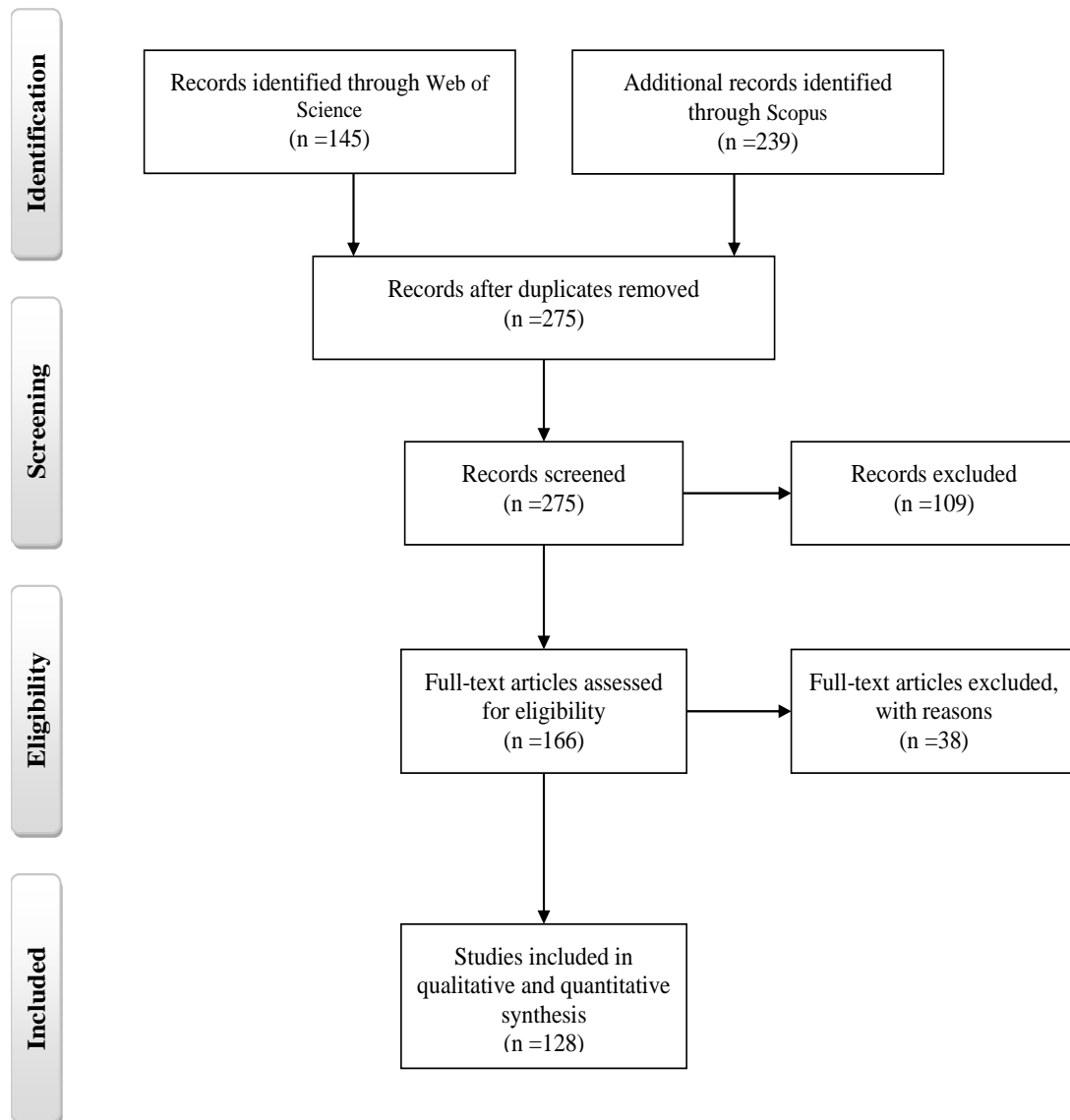


Figure 2.5.1. Literature search diagram

2.5.4. Results

2.5.4.1. Descriptive analysis

While the first paper meeting the inclusion criteria was published in 2003, most of the studies were published after 2018, which signals that this is a relatively recent area of research. Journal of Marketing for Higher Education (17 articles), Studies in Higher Education (6 articles), Higher Education (6 articles) account for the highest number of papers. However, a variety of publication outlets focused on education and development were found. Most studies have been conducted in different countries, mainly the UK, the USA, and Australia, in terms of the location of the study. A single-country emphasis is followed by most studies.

The methodology employed in the articles is shown in Figure 2.5.2. 28% of papers used a quantitative methodology, accompanied by 56% qualitative approaches to analysis, and 16% using a mixed methodology. The methods of data collection used in quantitative research include questionnaires and assessment, academic and cognitive tests, while the qualitative methods used include interviews, case studies, findings and focus groups in qualitative studies.

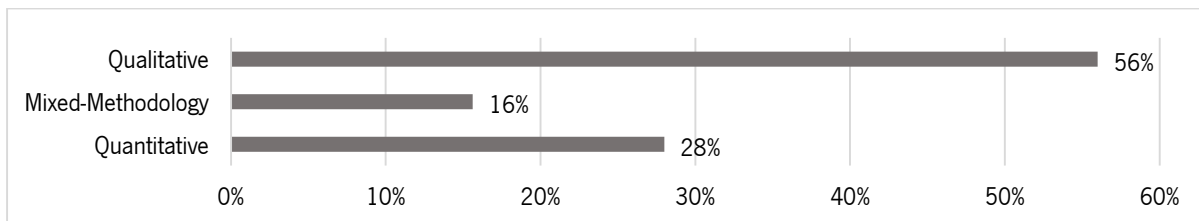


Figure 2.5.2. Studies' methodological choice

To understand the impact of these publications, we examined the number of citations and identified the 10 most cited articles in Figure 2.5.3: McCulloch (2009), Kotzé & Plessis (2003), Carey (2013), and Radnor *et al.* (2014) investigate students as co-producers; Bovill *et al.* (2016) address potential challenges in co-creating learning and teaching; Ng and Forbes (2009) focus on understanding the university experience through the service logic; Díaz-Méndez and Gummesson (2012) look at value co-creation and university teaching quality; Elsharnouby (2015) studies student co-creation behavior in HE; and finally, Blau, and Shamir-Inba (2017) present the role of co-creation and co-regulation in the flipped learning model (Figure 2.5.3).

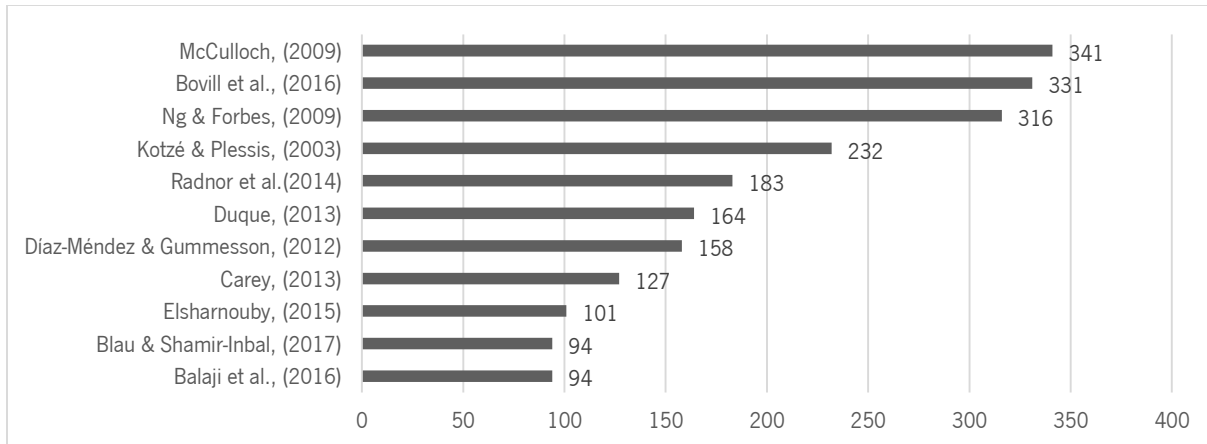


Figure 2.5.3. Most cited papers

2.5.4.2. Thematic analysis

A thematic analysis was conducted to organize a systematic view of the published works on student co-creation in HE context. Using a deductive approach, the selected papers were categorized according to three main themes: (1) Co-creation process and approaches in HE; (2) Student co-creation roles, and (3) Student co-creation behaviors in HE.

2.5.4.2.1. Co-creation process and approaches in HE

Service-dominant logic (SDL) is an approach developed by Vargo and Lusch (2006) expressing that all exchanges are co-created, as value is a joint procedure between what the organization offers and the client consumes (Dollinger & Lodge, 2019a; Dollinger *et al.*, 2018; Bryson, 2016; Smørvik & Vespestad, 2020; Qi *et al.*, 2020; Tuzovic, 2016). Dollinger *et al.* (2018) present the first conceptual model of value co-creation in HE. Their model incorporates key components of value co-creation, co-production, and value-in-use, as well as links to the anticipated advantages of value co-creation that include Knowledge, Equity, Experience, Personalization, and Relationship. According to this model, HEIs allow students to share knowledge more freely, which may support them to innovate their service while avoiding future risks. HEIs also provide assets such as a platform and specific knowledge of the previous production, and students can in turn provide assets such as feedback and novel ideas for innovation. Students can also actively participate in HE and take on customer-type roles. In HE, personalization through ViU also allows students to combine value propositions in their HE experience to meet their own desires. The relationship between students and the university also affects their feelings about the university and their HE experience (Carini *et al.*, 2006). Customization is another

component that can be supported with technology towards a greater scale of co-creation (Dollinger *et al.*, 2018).

Prahalad & Ramaswamy (2004) created the dialog, access, risk and transparency model (DART) to note the most significant components of the co-creation process (Ribes-Giner *et al.*, 2016). Co-creation implies a mutual procedure that is imaginative, inventive and resourceful. It draws on ideas from the teaching staff and students (Bovill, 2013). Dialogue includes finding a common platform and a common starting point where every individual can participate, regardless of their background and experience. Three forms of dialogue are emphasized and encouraged: teacher-student dialogue, student-student dialogue, and student-company dialogue. In a teaching situation, students must be given access and insight into the same information and expertise, and must also be provided with the necessary tools to process the information. Access and transparency include sharing knowledge and making it visible, not only in communication from lecturer to student, but also from student to lecturer, and student to student. When students and lecturers are willing to take the risk of engaging in co-creation, the perceived value of the learning result is prevalent (Smørvik & Vespestad, 2020; Ribes-Giner *et al.*, 2016, Bovill, 2013). Our thematic analysis shows that HEIs have been using different strategies and platforms to engage and involve students in the co-creation process.

Several studies, such as Duque (2013), Mostafa (2015), Dollinger *et al.* (2018), and Barros *et al.* (2016), used the student involvement approach to allow students to co-create. This happens when students play a more active role by spending more time on campus, devoting energy to studies, actively participating in student organizations, and interacting with faculty members and other students. Additionally, a huge number of methods of active engagement, such as willingness to invest time, energy, money or other resources, has been posited as being a critical state of reciprocal exchange in the consumption context.

Other studies point to emotional and cognitive student engagement (Fredricks *et al.*, 2004; Bond, 2020; Fredricks *et al.*, 2016), which allows students to co-create value in their HE experience. Cognitive engagement is characterized by self-regulated learning, utilizing deep learning strategies, and exerting the necessary effort for comprehending complex ideas (Fredricks *et al.*, 2004; Pintrich & De Groot, 1990; Zimmerman, 1990; Fredricks *et al.*, 2016). It is also clarified by Farhat *et al.*

(2020) that the intellectual brand experience represents the cognitive experiences students derive from services, such as HEIs brands, which results in students actively connecting with the brand and sharing the brand's information with their friends. Emotional engagement focuses on the extent of positive (and negative) reactions to teachers, classmates, academics, or school; the individuals' sense of belonging; and identification with school or subject domains (Voelkl, 1997). Balaji *et al.* (2016) indicate that students who identify with their university define themselves in relationship to the university and consider the university's successes and failures as their own. These authors also investigate the impact of student-university identification on different university supportive behaviours such as advocacy intentions, university affiliation, suggestions for improvement, and participation in future activities.

University affiliation alludes to the degree to which students personally identify with their university (Abdelmaaboud *et al.*, 2020) by displaying their university's logo, stickers, and merchandise. Participation in future university activities relates to the willingness of students to attend future events and functions held and sponsored by the university. Balaji *et al.* (2016) suggest that as students often utilize the university brand to create and communicate their self-concept to others, self-brand connection plays a significant role in communicating the identification-based supportive behaviours to others.

Our analysis shows that student co-creation takes the form of active participation in planning, designing, and delivering the educational services provided by HEIs. Hence, student co-creation approaches include the following categories (Table 2.5.1):

Student co-creation approaches	Examples
Co-creating teaching approaches	Designing short animated videos; designing web-based solutions; working as peer mentors; game design and development projects; improving the use of resources and learning aids; co-design of content; co-creation of learning experience and outcomes; embedded co-assessment for learning; producing podcasts or YouTube videos as curricular learning resources; creating prototypes and redesigns, and even implementing new ideas and solutions; identifying and posting journal articles, popular press articles and videos to an online forum. Moreover, students' final assessment task is to design a resource in a form of their choice related to a lesson they learnt through their placement activity or a theme covered in the unit.
Co-creating course design	Participating in educational program design workshops; forming a curriculum design team to writing or refining a unit guide; and designing the learning environment.

Co-producing knowledge	Discipline-based or action research; scholarship of teaching and learning; gaining and sharing knowledge; co-teaching; service learning community engagement; co-research.
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Table 2.5.1. Student co-creation approaches

Source: own elaboration

2.5.4.2.2. Student Co-Creation Roles

Cook-Sather (2014. p. 187) argues that student and teacher roles need to be challenged and reconsidered in HE towards regarding students as “full partners with faculty in analyses and revisions of pedagogical practice”. According to Xu *et al.*, (2018), multiple roles of students incorporate “client”, “partner”, “co-producer”, “product”, and “citizen”. In the university, students progressively have opportunities to play roles as consultants, student representatives, co-researchers (Bell, Stevenson & Neary, 2009) or curriculum co-designers (Bovill *et al.*, 2016). Dollinger and Mercer-Mapstone (2019) unpack the five metaphors frequently used to redefine student roles in HE: students as consumers, students as producers, students as co-creators, students as partners, and students as change agents.

Our review has identified the following roles of students in value co-creation in HE (Table 2.5.2):

Students as producers: Positioning students as producers is to argue that all knowledge in HE is co-produced by those who interact in HE communities, including students. Thus, the concept of students as producers highlights the intellectual and experiential value that students bring to HE. Co-production can happen on an individual level as students co-produce their education through socialization, interaction, and knowledge formation in HEIs environments (Kotzé & Plessis, 2003; Dollinger & Mercer-Mapstone, 2019). The term co-creation identifies students as knowledge producers and further suggests that students have valuable resources, such as perspectives, ideas, opinions, and experiences, which can stimulate HE (Dollinger, 2018). Some examples of student as producers include co-creating course design (faculty, students, and academic development staff at the university have experimented with an assortment of approaches to partner in ‘course design teams’ that co-create, or re-create, a course syllabus (Kay *et al.*, 2019). These activities, similar to the co-creation of teaching approaches and curricula, encourage the progress of dialogue between students and teaching staff, from the design of the activity or procedure to the outputs and final dissemination.

Students as participants: Some co-creation activities that feature student roles as academic participants include: co-creating of teaching approaches (faculty and students engage in intelligent

exchange about what is happening and what could be happening in HE classrooms (Kay *et al.*, 2019; Barbera *et al.*, 2017); co-governance and student participation in subjects or work-integrated learning opportunities (Dollinger, 2018; Dollinger & Mercer-Mapstone, 2019); and co-creating of educational plans (the co-creation of curricula leads students and academic staff to work in partnership to create some or all aspects of the planning, implementation and assessment of the learning experience (Kay *et al.*, 2019).

Students as change agents: This construct defines processes similar to partnership, but places leadership and agency directly within the student's domain. One example is a group of students exploring how technology can be used in their curriculum-designing of original resources and measuring student engagement and satisfaction with those resources. A further argument for the importance of student agency in shaping their own HE experiences is to redress the frequent positioning of students as objects in HE research and practice, rather than as responsible and valuable participants and agents (Fleischman *et al.*, 2015; Dollinger & Mercer-Mapstone, 2019).

Students as partners: This concept is characterized as student-faculty-department collaboration towards the procedure and results of the teaching and learning experience. Partnership is a specific type of values-based relationship (Kaminskiene *et al.*, 2020; Bovill, 2019; Fleischman *et al.*, 2015; Baumber *et al.*, 2020; Partington, 2020; Duque, 2013; Dollinger *et al.*, 2018; Kay *et al.*, 2019); Ruskin & Bilous, 2019; Bryson, 2016; Farhat *et al.*, 2020; Fleischman *et al.*, 2019). "It is a collaborative, reciprocal procedure through which all participants have the opportunity to contribute equally, although not necessarily in the same ways, to curricular or pedagogical conceptualization, decision-making, implementation, investigation, or analysis" (Bovill *et al.*, 2014:6–7). Johnson (2021) argues that considering students as active partners is one of the key features of teaching excellence. The academic partnership is a framework for engaging university students in overlapping and reinforcing areas of (1) learning, teaching and evaluation, (2) curriculum design and consultancy (Bovill *et al.*, 2016; Bovill, 2019; Cook-Sather, 2014; Lubicz-Nawrocka & Simoni, 2018; Murphy *et al.*, 2017; Jukema *et al.*, 2019), (3) discipline-based research (Maunder *et al.*, 2013), and (4) the scholarship of learning and teaching (Ruskin & Bilous, 2019; Bryson 2016; Cassidy *et al.*, 2019; Kneale, 2018; Perello-Marín *et al.*, 2018; Barbera *et al.*, 2017).

2.5.4.2.3. Student Co-Creation behaviors

Several studies (Elsharnouby, 2015; Yu *et al.*, 2019; Sutarso *et al.*, 2019; Balaji *et al.*, 2016) utilized Yi and Gong's (2013) and Tari Kasnakoğlu and Mercan's (2020) model to measure student co-creation behavior in HE. Yi and Gong (2013) developed a scale for estimating client co-creation behavior. They operationalized co-creation behavior as a multidimensional construct entailing two variables: client participation behavior (CPB) and client citizenship behavior (CCB). These two authors distinguished four CPB components that include information seeking, information sharing, responsible behavior, and personal interaction, as well as four other dimensions of CCB: helping, advocacy, tolerance, and feedback (Elsharnouby, 2015; Foroudi *et al.*, 2019). These co-creation behavior components have been applied in several studies (Table 2.5.2). Dollinger (2018) added 'prosumer behaviour': when clients produce content or other related value in the service. Student co-creation behaviors identified in the present study include:

Information seeking – students look for data to clarify service requirements, understand their expected roles, and learn how to perform their tasks. Students can look for data by asking other students or employees, can search for information on the university's website or other online platforms, or watch other students' behaviors while getting the service (Elsharnouby, 2015; Foroudi *et al.*, 2019).

Information sharing – giving essential information to the HEI service provider's personnel to enable them to perform their duties and provide the service that meets their needs (Yi & Gong, 2013). Examples include giving information about the scheduling of replacement classes, asking a lecturer to provide information about coursework, looking for information about course materials, informing a lecturer about their assignments, and communicating difficulty in understanding a course (Sutarso *et al.*, 2019).

Responsible behavior – taking on students' responsibilities and duties, such as completing all coursework given by the lecturer, meeting a minimum level of class attendance, listening carefully when a lecturer explains lessons, following the directions of a lecturer on how to perform in class, and greeting when meeting a lecturer (Ennew & Binks, 1999; Sutarso *et al.*, 2019).

Personal interaction – engaging in interpersonal relationships with the HEI service provider's employees that are necessary for effective service delivery (Elsharnouby, 2015; Ennew & Binks, 1999;

Foroudi *et al.*, 2019).

Helping behavior – assisting different fellow students with difficulties, briefing a fellow student who was absent or arrived late, sharing personal creation of an important model with their colleagues, and helping individual students run a software application (Mazen *et al.*, 2008; Allison *et al.*, 2001). According to Sutarso *et al.* (2019), helping refers to the degree to which a student helps others in the learning procedure, such as assisting fellow students who have difficulty in completing coursework or who have issues in understanding course material, as well as teaching other students on how to understand the course material.

Tolerance – dealing with inconveniences such as having to endure a change of classrooms, accepting inconvenient study conditions, accepting alternative class meeting times to accommodate the majority, and undertaking an extra assignment not included in the syllabus but relevant to the course goals (Elsharnouby, 2015; Foroudi *et al.*, 2019). Other examples are trying to understand when the class is rescheduled by a lecturer, being patient when a lecturer takes inappropriate actions, and adjusting when a lecturer postpones a class (Sutarso *et al.*, 2019).

Advocacy – incorporates speaking positively about the class to outsiders and recommending the course to other people (Mazen *et al.*, 2008), consistently supporting their college's social activities (Khalid *et al.*, 2013), being willing to recommend the institution to other people, keeping in touch with the staff, selecting the organization again for future study or joining the alumni groups (Elsharnouby, 2015). Advocacy intentions in Balaji *et al.* study (2016) allude to the act of promoting and safeguarding the interests of the university. Student advocacy behaviours include positively speaking about the university, representing the university to external publics (Peruta & Shields, 2018), recruiting for the university, and lending support to the university.

Feedback – refers to voluntary acts in which organizational members engage in the learning process, such as responding when a lecturer gives an appealing explanation, telling a lecturer when they have an idea from learning activities or when they have an issue in receiving an explanation in class. Suggestions for improvement are valid contributions, with students voluntarily sharing their opinions and contributing with ideas for the university to provide a better service to the students (Sutarso *et al.*, 2019; St. John-Matthews *et al.*, 2020).

Prosumer behavior – sometimes known as ‘presumption’, it can support the scalability of co-creation. Prosumer behavior occurs when clients produce content or other related value in the service (Toffler, 1980). Famous examples involve platforms such as Facebook and Twitter, where HEIs have a profile but whose content is written by the students. Prosumer behavior can lead to brand communities, or groups of clients who strongly identify with a brand and are willing to donate resources (Dollinger, 2018).

Table 2.5.2. shows all student co-creation behaviors and roles.

Student co-creation behaviors and roles		References
Student co-creation roles	Co-creator of teaching approaches	(Sanina et al., 2020), (Smørvik & Vespestad, 2020), (Qi et al., 2020), (Marnica & Mazur, 2020), (Partington, 2020), (Gkogkidis & Dacre, 2020), (Bovill, 2020), (Cook-Sather, 2020), (Kaminskiene et al., 2020), (Doyle & Buckley, 2020), (Tari Kasnakoğlu & Mercan, 2020), (Davis & Pamerter, 2020), (Kleczeck et al., 2020), (Vespestad & Smørvik, 2019), (Vidakis et al., 2019), (Kuhmonen et al., 2019), (Cavallone et al., 2019) (Dollinger & Lodge, 2019a, 2019b), (Dollinger & Mercer-Mapstone, 2019), (Doyle et al., 2019), (Bovill, 2019), (Luckner et al., 2019), (Ruskin & Bilous, 2019), (Cassidy et al., 2019), (Pee, 2019), (Lim et al., 2019), (Ribes-Giner et al., 2018), (Ranjbarfard & Heidari Sureshjani, 2018), (Uskoković, 2018), (Blau & Shamir-Inbal, 2018), (Kuhmonen et al., 2018), (Antoniou & Bamidis, 2018), (Perello-Marin et al., 2018), (Blau & Shamir-Inbal, 2017), (Burford & Chan, 2017), (Pöyry-Lassila et al., 2017), (Barbera et al., 2017), (Beighton, 2017), (Diaz et al., 2016), (Haraldseid et al., 2016), (Tuzovic, 2016), (Bowie & Cassim, 2016), (Mononen et al., 2016), (Phillips & Napan, 2016), (Bovill et al., 2016), (Garland et al., 2015), (Wong Kung Fong, 2013), (Zulkefli & Uden, 2013), (Kotzé & Plessis, 2003)
	Co-producer	
	Co-creator	
	Change Agent	
	Participant	(Parkes et al., 2020), (Irick et al., 2020), (Könings et al., 2020), (Baumber et al., 2020), (Davis & Pamerter, 2020), (Brook et al., 2020), (Elliott et al., 2020), (Dollinger & Vanderlelie, 2020), (Ho, 2020), (Niinikoski, 2019), (Cavallone et al., 2019), (Dollinger & Lodge, 2019a, 2019b), (Niinikoski, 2019), (Jukema et al., 2019), (Cassidy et al., 2019), (Ruskin & Bilous, 2019), (Bovill et al., 2016), (Bovill, 2019), (Taylor & Bovill, 2018), (Tsui & Dragicevic, 2018), (Blau & Shamir-Inbal, 2018), (Bovill & Woolmer, 2018), (Bovill & Woolmer, 2018), (Kneale, 2018), (Perello-Marin et al., 2018), (Kuhmonen et al., 2018), (Lubicz-Nawrocka & Simoni, 2018), (Blau & Shamir-Inbal, 2017), (Hiedemann et al., 2017), (Murphy et al., 2017), (Diaz et al., 2016), (Bowie & Cassim, 2016), (Sugino et al., 2016), (Fleischman et al., 2015), (Radnor et al., 2014), (Cook-Sather, 2014), (Carey, 2013), (Zulkefli & Uden, 2013), (Zulkefli & Uden, 2013)
Partner	Co-creator of course design	
	Co-producer of knowledge	(Ogunmokun et al., 2020), (Dollinger & Vanderlelie, 2020), (Wallin, 2020), (Davis & Pamerter, 2020), (Ruskin & Bilous, 2019), (Dollinger & Mercer-Mapstone, 2019), (Perello-Marin et al., 2018), (Kuhmonen et al., 2018), (Ribes-Giner et al., 2018), (Galloway & Edwards, 2017), (Diaz, Ribes-Giner & Perello-Marin, 2016), (Bovill et al., 2016), (Hamby & Brinberg, 2016), (Fillery-Travis, 2014), (Fleischman et al., 2010), (McCulloch, 2009)
Student Co-creation Behavior	Student Participation Behavior	Information seeking Information sharing Responsible behavior Personal interaction Prosumer behavior
	Student Citizenship Behavior	(Faroudi et al., 2020), (Torkzadeh et al., 2020), (Tari Kasnakoğlu & Mercan, 2020), (Farhat et al., 2020), (Voropai et al., 2019), (Foroudi et al., 2019), (Monavarifard et al., 2019), (Sutarso et al., 2019), (Sahi et al., 2019), (Manzoor et al., 2019), (Fleischman et al., 2019), (Eldegwy et al., 2018), (Antoniou & Bamidis, 2018), (Elsharnouby, 2015)
		Feedback
		Advocacy

Helping	(Manzoor et al., 2020), (Tari Kasnakoglu & Mercan, 2020), (Farhat et al., 2020), (Torkzadeh et al., 2020), (Foroudi et al., 2019), (Monavarifard et al., 2019), (Sahi et al., 2019), (Manzoor et al., 2019), (Sutarso et al., 2019), (Elsharnouby, 2015),
Tolerance	(Farhat et al., 2020), (Torkzadeh et al., 2020), (Sutarso et al., 2019), (Foroudi et al., 2019), (Monavarifard et al., 2019), (Elsharnouby, 2015), (Manzoor et al., 2019),

Table 2.5.2. Student co-creation behaviors and roles

Source: own elaboration

2.5.5. Future lines or research

In this review, we analyzed how student co-creation has been conceptualized in previous studies and examined how this research topic has been explored over the years. A framework is proposed (Figure 2.5.1) summing up the results that emerged from this review. This image constitutes a map of extant research on student co-creation in HE.

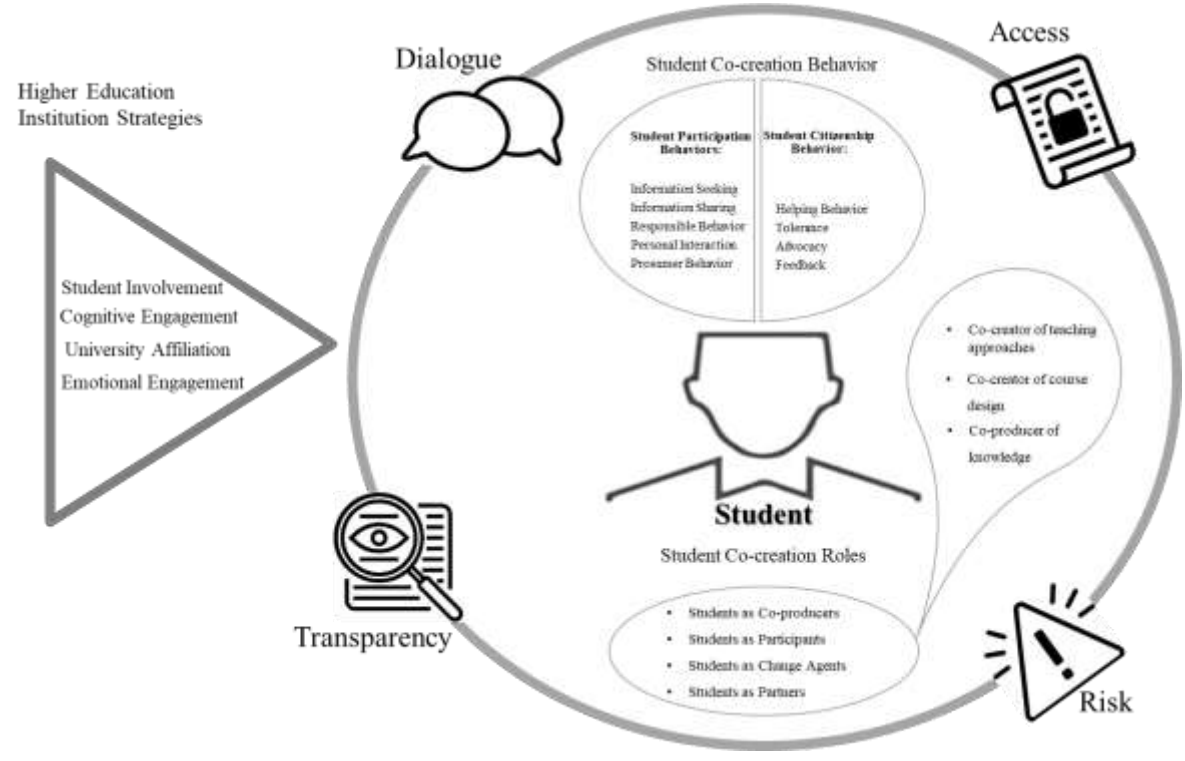


Figure 2.5.4. Map of Student Co-Creation, Process, Behaviors and Roles in HE

This study revealed some gaps in the literature that need to be further addressed. Based on our systematic review, we propose three main directions for further research:

Co-creation strategies and platforms in HE

HEIs have been using different strategies to involve and engage students to co-create their HE experience. More research efforts are needed to further the understanding of co-creation strategies

and platforms in HE with regard to every aspect covered in the present review. Examples include collaborative learning projects, namely inter-institutional and international projects, digital platforms, new approaches such as game-based methodologies, open educational resources, etc.

Identifying the motivations that prompt students to engage in co-creation in HE

Future studies can investigate the initial motivations, process, and outcomes of co-creation in HE to adopt participatory design. In order to incorporate other antecedents, such as culture and ethical values – which would provide interesting insight into how the process is affected by the different cultures of a nation –, it would be useful to investigate the boundary conditions or moderating factors that could impact students' motivation to co-create their HE experience.

Understanding value from the perspective of the different HE stakeholders

Further studies can focus on students' perceived value related to co-creation in HE to identify relevant motivation segments to prompt students to co-create. Future research can also explore the benefits and costs of co-creation for students and explore students' perceived price and risks of co-creation.

Identifying the consequences of co-creation in HE

The analysis to identify the consequences and outcomes of co-creation in HE is still in its infancy. Although some scholars have proposed models and processes of analysis, the question involving how effectiveness of co-creation in HEIs can be measured remains open and calls for increased research efforts. The topic is of utmost importance for both academics and practitioners, as it can help boost the performance of co-creation in HEIs and their commitment to co-creation practices: How can technology and innovation advance co-creation approaches in HE? How does cognitive dissonance and satisfaction/dissatisfaction influence students' co-creation behaviors and roles? What is the opinion of faculty, governing bodies, employees, alumni and staff or industries regarding the co-creation process? Finally, it may be worthwhile to explore the benefits of curriculum co-creation for both students and faculty staff, since there is only anecdotal evidence to suggest that this way of working might also benefit workplace partners. Given the increasing internationalization of HE, it is essential to understand how different student co-creation behaviors are impacted by

different cultures.

2.5.6. Conclusion

Over the last decade, there has been a growing interest within the HE sector in students becoming producers, partners and co-creators of their HE experience (Bovill, 2013). By providing opportunities to co-create value at levels consistent with student preference, HEIs need to identify how to encourage students to engage in value creation. As indicated by Bryson (2016), educational developers and instructors have favored trying to make the student experience more engaging based on the premise that engagement leads to greater persistence, improved learning, and achievement.

This paper provides a systematic review of the literature on student co-creation approaches in order to consolidate the view on co-creation approaches used in HE that can contribute to clarifying a co-creation model in HE based on current literature on student co-creation in HE.

From the descriptive analysis results, we conclude that most publications were issued after 2018, mostly in higher education journals. These studies were mostly conducted in the USA and the UK.

We identified that the main approaches used by HEIs to identify the student co-creation process in HE derive from the SDL approach. We also identified that the main student co-creation roles in HE are students as producers, students as co-creators, students as change agents, students as partners, and students as participants. Moreover, student co-creation approaches identified by this study include co-creating of teaching approaches, co-creating of course design, and co-producing knowledge. Student co-creation behaviors in HE include: Information seeking, Information sharing, Responsible behavior, Personal interaction, Helping behavior, Tolerance, Advocacy, Feedback, Prosumer behavior.

2.5.7. Implications and recommendations

Co-creation in HE is of paramount importance since being perceived as (more) customer-oriented is an increasingly critical strategic priority for HEIs. Universities seek to be viewed as customer-oriented, as this can positively impact important relational outcomes such as satisfaction, retention, and positive word of mouth. Such efforts can assist HEIs in better balancing and aligning interests between academics and students as a means of increasing the many experiential aspects (touchpoints) of the

HE service model. The present study emphasizes the importance of HEIs comprehending the appropriate co-creation approaches and processes. Understanding students' intention to co-create can help universities maintain or gain competitive advantage through customer co-creation, student suggested/influenced improvements and innovations (Robinson & Celuch, 2016).

Co-creation in HE places students at the center of the process, rather than policymakers or professionals, and has significant implications for process management, such as how HE innovations are developed and how risk is managed in the innovation process. Moreover, it implies that student co-production is improving the quality and impact of existing HE services and bringing students' experience together with participative planning to generate new approaches to HE services (Radnor *et al.*, 2014). In order for co-creation to take place, both HEIs and students should be united and work hand in hand to create a better service and a differentiated product (Giner & Peralt Rillo, 2016). This study provides a map of student co-creation in HE by identifying the approaches and the process that allow students to play co-creating roles and behaviors and participate in co-creating the HE experience.

This paper brings together prior research prior research and draws decision-makers' attention to the co-creative role played by students throughout the production and delivery of services. HE managers, educational developers and instructors should be aware that when students engage in participation and citizenship behaviors, it impacts their evaluations of service quality, their feelings of satisfaction, perceptions of goal attainment, and behavioral intentions. As our systematic literature shows, there are several approaches to the process of co-creation that institutions can pursue. HEIs have tremendous potential to devise strategies for leveraging students' participation and their inputs as an unlimited resource (Torkzadeh *et al.*, 2020). HEIs need to find ways to devise the most adequate approaches depending on the profile of the institution, the resources available, the area of study, etc. In addition, the manifold roles and behaviour that students can take on as part of a co-creation approach make this a very flexible strategy for promoting student persistence, learning, and achievement.

2.5.8. Limitations

Although the concept of co-creation in HE has been around for a long time, this review has shown that literature development is still at an early stage. This work has several limitations. First, it does not include all possible academic sources, but it is focused on major databases of scientific journals. Relevant knowledge might also come from investigations that are not included in the selected list, such as textbooks, working papers, or editorial contributions. Second, the cloud of keywords could be enriched or modified to extend the coverage of potentially interesting articles. Moreover, some studies might utilize different labels of keywords to refer to co-creation depending on the theoretical development, which constitutes the foundation of the study.

The descriptive analysis revealed that the number of published articles is still limited, thus calling for a growing commitment of academics. Moreover, the majority of the works considered are case studies or conceptual development papers, whereas research aimed at exploring broader data sets is scarce. Hence, more research efforts are needed to further the understanding of co-creation in HE with regard to every aspect covered in the present review.

Chapter 3 Theoretical model and hypotheses

Abstract

This chapter presents the theoretical models developed based on the literature review of the variables addressed in Chapter 2. Therefore, the aim of this chapter is to present hypotheses regarding answering the research questions based on a detailed examination of the student satisfaction with GBL environment and student perception of value and student co-creation behavior in GBL in HE literature.

3.1. Introduction

A substantial body of research has been done considering the factors that influence student satisfaction and retention (Butt & Rehman, 2010). The strategic and economic importance of researches on satisfaction in higher education(HE) has led to academic and management attention in different research fields identified with HE (Santini *et al.*, 2017). In recent decades, experts have been attempting to outline the construct of satisfaction after identifying the need to monitor student satisfaction as a method of assessing the general performance of higher education institutions (HEIs) (Martirosyan, 2015; Wilkins & Balakrishnan, 2013). Furthermore, student satisfaction will allow HEIs to enhance their reputation (Nowell, 2017), and image (Elsharnouby, 2015), and reduce students' defection (DeShields *et al.*, 2005). In practice, as a response to universities' interests regarding the quality of their programs, student satisfaction with their HE experience has become a significant area for universities' performance indicators. Another factor that makes student fulfillment of unique importance to universities is that it has become a measure used to compile rankings and league tables.

As Butt and Rehman (2010) indicate, numerous examinations have been conducted to measure student satisfaction at the university level. Different elements have been recognized that can potentially influence student satisfaction with various education services provided by the universities, such as faculty performance, classroom environment (Elliott *et al.*, 2008; Clemes *et al.*, 2007; Parahoo *et al.*, 2013), learning facilities (Mavondo *et al.*, 2004) and so on. In fact, satisfaction with the learning process is defined as an effective learning outcome that focuses on increasing the learner's experience in the subject (Gupta & Bostrom, 2009, p. 692). According to Sierra and

McQuitty (2005), the outcome of the content is not the most important component in determining satisfaction (a student may not do well in a subject but was inspired by and happy with the way the subject was taught).

The new generation of students learn in unique styles (Prensky, 2014), preferring to study material that is useful, enjoyable, and relevant. It has become a new educational challenge to figure out how this generation can learn more effectively and what their preferred learning methods are. Moreover, the lack of motivation of students to learn (Lee & Hammer, 2011) became a fundamental problem in modern education (Garcia-Iruela & Hijiñ-Neira, 2020). The education industry has had to be reinvented and altered to meet the demands, preferences, and orientations of digital natives, to be successful in the 21st century.

In recent years, interest in using games as a teaching and learning strategy (Menon & Romero, 2019) has grown, notably in HE. It is imperative not only to find adequate tools to make up for the learning loss but also to prepare for a new education paradigm combining distance learning, in-classroom learning and blended learning (Darling-Hammond & Hylar, 2020). Game-based Learning (GBL) is viewed as a potential method for increasing students' confidence and enhancing their motivation by incorporating challenge, curiosity and fantasy into a particular issue (Garris *et al.*, 2002). GBL provides an avenue to dynamic learning and offers students the chance to apply what they learn in an enjoyable, stress-free environment (Menon & Romero, 2019).

In the interest of heightening students' motivation, teaching methods are moving towards complex techniques including experiential learning that can unleash students' dedication to their own learning procedure. Inside this unique circumstance, the utilization of instructional games gives lecturers intelligent methods for conveying knowledge in a more relaxed and stimulating way (Gil-Doménech & Berbegal-Mirabent, 2019). Previous examinations assume that the gamification of teaching is a critical direction to follow, permitting students to become the focal point of their learning journey while expanding their inspiration and active participation. Gil-Doménech and Berbegal-Mirabent (2019) show how dynamic learning methods such as GBL can boost students' intrinsic inspiration in a low-motivated environment (de la Torre & Berbegal-Mirabent, 2020). Through this co-creation process, students' resources such as time, novel ideas and feedback are merged with organizational

resources to foster a series of experiences and activities that promote interaction and exchange, and this in turn can prompt improved practice and innovation (Dollinger *et al.*, 2018).

Also, understanding student perception of value is critical to the success of any new pedagogic endeavor, as perceptions have a direct impact on how much effort students will put into educationally purposeful activities, which has direct implications for their learning as well (Buckley *et al.*, 2006; Rumreich & Kecskemeti, 2019). In the educational setting, value perception provides a means by which institutions can comprehend, manage and influence value among all stakeholder groups, and drive course design and strategic planning (Chung & McLarney 2000; Ng & Forbes 2009). Chung and McLarney (2000) contend that the essential aim of the learning experience is to create value for students. Furthermore, reflecting a growing business and marketing trend for a more active customer role, current perspectives recommend that students ought to be involved as active co-creators of the university and learning experience (Bowden & D'Alessandro, 2011; Klemenčič, 2015; Dusi & Huisman, 2020). Students who participate in a co-creation activity such GBL contribute their own viewpoints, experiences, skills, and knowledge (Bovill, 2013).

Gamification and GBL in HE are becoming increasingly popular. However, very few studies examine student's perception of value of the GBL, student co-creation behavior and satisfaction. Value in education is crucial for HEI strategic planning and market orientation. Hence, comprehending, managing, and impacting student perception of value is key for both students and HEIs. The exploration will help the administrators of the universities and the policymakers to focus on these elements that impact on satisfying students as well as co-creation behavior. This will contribute to a superior service quality provided by the universities and develop HE marketing and strategy knowledge, specifically in which refers to student satisfaction and co-creation in a low motivating environment.

3.2. Student satisfaction with Game-based learning

Satisfaction is a concept that refers to the evaluation of perceived differences between a product/service's expectations and its performance after consumption (Oliver, 1980; Elkhani & Bakri, 2012). Student fulfillment with the university experience is a complex and multifaceted phenomenon. Several studies have focused on student satisfaction at the university level. Various factors have been identified as having the potential to influence student satisfaction with diverse

university education services such as student academic accomplishment, faculty performance, classroom environment, learning facilities, institution reputation (Butt & Rehman, 2010), HELs' Identity, marketing orientation, perceived value in educational services (Usman, 2010), resources provided to the student, and university environment (Santini *et al.*, 2017). Satisfaction with the learning process can be defined as learners' positive feelings about their performance and the affective outcomes of their learning (Gupta *et al.*, 2010).

It is significant to innovate in current teaching training at HE in order to improve students' involvement, perception of value, collaboration and motivation (Gil-Doménech & Berbegal-Mirabent, 2019). Students are more satisfied, better understand what they have learned, and are motivated to learn more when they learn by playing (Chen *et al.*, 2020; Hernández-Fernández *et al.*, 2020). According to Aleckson, (2009) learning is divided into two types: learning to know and learning to do. Learning to know comprises gaining information from stories, lectures, music, and other sources, while learning to do implies practicing or experiencing by playing games. Since most students enjoy games, the gamification teaching style became quite popular very quickly after its creation (Huotari & Hamari, 2012; Landers & Armstrong, 2017).

The use of games or activities in a non-playful context is referred to as gamification or GBL (Yildirim, 2017). The term "gamification" appears to have been created in 2002 by Nick Pelling, with the first recorded appearance in 2008. However, the term did not gain extensive recognition until 2010 (Panis *et al.*, 2020; Deterding *et al.*, 2011). GBL is seen as a potential method for increasing students' confidence and motivation by integrating challenge, curiosity, and fantasy to a specific topic (Garris *et al.*, 2002). In this setting, players can collaborate in several ways by competing with other players or teams, with the system or with themselves (Gil-Doménech & Berbegal-Mirabent, 2019). Games stir a quantity of positive emotions such as feeling focused, involved, and accomplished (Dias, 2017; Reeves & Read, 2010). Games additionally, increase people's engagement and productivity (Buckley & Doyle, 2016; Kim, 2012), and they have the potential to motivate people (Subhash & Cudney, 2018). In this context, education/learning standards have attempted to keep up with a new student profile focused on the digital environment by developing new learning methods that offer an innovative alternative for the development of student skills (Signori *et al.*, 2018). GBL provides a platform for dynamic learning and allows students to apply

what they have learned in a fun, stress-free setting (Menon & Romero, 2019). GBL cultivates a person's intellectual and creative skills, enables them to apply essential knowledge and principles in a variety of unpredictable situations, assists in the development of behavior strategies, and stimulates communication and collaboration with others (Rodina & Chekushkina, 2015).

3.3. Student Co-creation behavior in GBL in HE

Dollinger *et al.* (2018) proposed a model to study value co-creation in HE. Value co-creation, value-in-use (ViU), and co-production are all significant components of their study's model. Verwoord (2016) adds that while students are not disciplinary experts, they are experts at being students and hence have the skill and knowledge frame required to contribute effectively to the development of practice. Universities that allow students to openly share their knowledge may be able to innovate their services while avoiding future risks. Students can also provide assets such as feedback and innovative ideas for innovation if the university provides assets such as a platform and particular knowledge of prior productions (Dollinger *et al.*, 2018).

Several studies tried to measure student co-creation behavior in HE (Elsharnouby, 2015; Yu *et al.*, 2019; Sutarso *et al.*, 2019; Balaji *et al.*, 2016) utilized Yi and Gong's (2013) scale. Through their systematic review, Yi and Gong (2013) developed a scale for estimating customer co-creation behavior. They operationalized co-creation behavior as a multidimensional construct made up of two variables: customer participation behavior (CPB) and customer citizenship behavior (CCB). These two authors distinguished four CPB components: information seeking, information sharing, responsible behavior, and personal interaction, and four other components for CCB: helping, advocacy, tolerance, and feedback (Elsharnouby, 2015; Foroudi *et al.*, 2019). The co-creation behavior components proposed by these four authors have been applied in several studies, however, limited work has been assumed on understanding the student co-creation behavior in GBL. In the following paragraphs, we present the main student co-creation behaviors based on Elsharnouby (2015) and Foroudi *et al.* (2019, 2020).

Customer participation behavior:

Information seeking: Students may look for data by asking other students or employees, may search for information on the university's website or other online platforms, or watch other students'

behaviors (Elsharnouby, 2015; Foroudi *et al.*, 2019) in GBL environment. **Information sharing** happens when students share critical information with the lecturer to enable them to perform their duties and provide the service that meets their needs.

Responsible behavior: Students, according to Ennew and Binks (1999) have responsibilities and duties as partial employees, such as completing all coursework assigned by the lecturer, maintaining a minimum level of class attendance, listening attentively when a lecturer explains lessons, and following a lecturer's directions in how to perform in class (Sutarso *et al.*, 2019). **Personal interaction** alludes to interpersonal relationships between students and the lecturer that are necessary for effective service delivery (Elsharnouby, 2015; Foroudi *et al.*, 2019).

Customer citizenship behavior:

Feedback refers to the factor demonstrating how much a student gives feedback (Sutarso *et al.*, 2019; St. John-Matthews *et al.*, 2020) in the GBL procedure, for instance, responding when a lecturer gives an appealing explanation, telling a lecturer when they have an idea from GBL or when they have an issue in receiving an explanation in class. **Advocacy** incorporates speaking positively about the GBL to outsiders and recommending that to others, consistently supporting the college's social activities (Elsharnouby, 2015).

Helping behavior refers to the degree to which a student helps others in the learning procedure, such as helping fellow students who have difficulty in completing coursework or who have issues in understanding course material, game, and teaching other students how to understand (Mazen *et al.*, 2008; Allison *et al.*, 2001;Sutarso *et al.*, 2019). **Tolerance** behavior includes being patient when a lecturer takes inappropriate actions (Elsharnouby, 2015; Foroudi *et al.*, 2019; Sutarso *et al.*, 2019).

Several studies have emphasized that games and GBL are tools for student co-creation in HE. Pöyry-Lassila *et al.* (2017) further stress that the potential of game design and development projects support extensive engagement and knowledge co-creation. In educational games, co-creation appears as a collaborative design of the gaming environment by students and teachers. Students become equal subjects in the educational process through co-creation, which improves their self-awareness (Elsharnouby, 2015; Lubicz-Nawrocka & Simoni, 2018). The benefits of student co-creation for HEIs include improved teaching and classroom experiences, increased metacognitive

awareness and a stronger sense of identity, improved student-staff relationships, and the development of a variety of graduate attributes (Bryson, 2016; Muramalla, & Alqahtanib, (2019). Meanwhile, having greater responsibility for crafting their own learning experience helps students gain confidence, and many authors believe it increases student satisfaction and passion. Because of the friendly and cooperative learning environment, students are happy and love learning in a collaborative environment (Hounsell *et al.*, 2007, Bovill, 2013, Ho, 2020, Bovill, 2014, Bovill *et al.*, 2011, Sanina *et al.*, 2020, Sahi *et al.*, 2019, Muramalla *et al.*, 2019, Hussain, 2012, Celuch *et al.*, 2018, and Dollinger & Lodge, 2019).

The value in the co-creation process can happen in both co-production (how students contribute to the design, procedures, or implementation of the activity) and value in use (ViU) (how students/teaching staff create value for themselves through the activity) (Dollinger & Lodge, 2019a; Dollinger *et al.*, 2018; Bryson, 2016; Smørvik & Vespestad, 2020; Qi *et al.*, 2020; Tuzovic, 2016).

Customer satisfaction and customer loyalty have been studied extensively as outcomes of businesses integrating customers' obligations (Chen & Wang, 2016; Vargo, 2008). Customer value co-creation commitment is linked to attitudinal and behavioral loyalty, according to Cossio-Silva *et al.* (2016). Likewise, with an attention to the HE industry, several studies investigated the impact of students' commitments to value co-creation on student satisfaction, loyalty, and service expenditure (Foroudi *et al.*, 2020; Bryson, 2016; Elsharnouby, 2015; Foroudi *et al.*, 2019; Dollinger & Lodge, 2019a; Dollinger *et al.*, 2018; Qi *et al.*, 2020; Smørvik & Vespestad, 2020; Sutarso *et al.*, 2019; Tuzovic, 2016)). Students' co-creation value is a novel phenomenon from 2010 (Hatch & Schultz, 2010) that is linked to satisfaction. Based on the literature, we propose the first hypothesis and two sub hypothesis (Figure 3.1):

H1. Student Co-creation behavior during GBL has an impact on student satisfaction with GBL in HE.

Based on the literature that proposes that co-creation involves participation behavior and citizenship behavior, each with several sub-dimensions we divide the main hypothesis on the following sub-hypotheses.

H1a: Student participation behavior during GBL has an impact on student satisfaction with GBL in

HE.

H1a (1): Information seeking during GBL has an impact on student satisfaction with GBL

H1a (2): Information sharing during GBL has an impact on student satisfaction with GBL

H1a (3): Responsible behavior during GBL has an impact on student satisfaction with GBL

H1a (4): Personal interaction during GBL has an impact on student satisfaction with GBL

H1b: Student citizenship behavior during GBL has an impact on student satisfaction with GBL in HE.

H1b (1): Feedback during GBL has an impact on student satisfaction with GBL

H1b (2): Advocacy during GBL has an impact on student satisfaction with GBL

H1b (3): Helping behavior during GBL has an impact on student satisfaction with GBL

H1b (4): Tolerant during GBL has an impact on student satisfaction with GBL

Figure 3.1 represents these hypotheses.

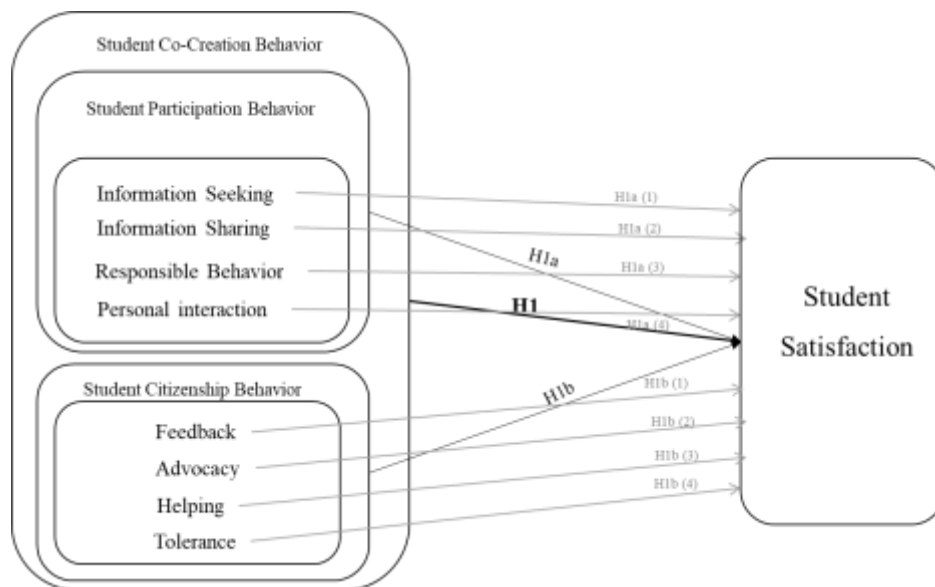


Figure 3.1. Hypothesis 1

Source: Own elaboration

3.4. Perception of value of GBL in HE

Understanding student perception is critical to the success of any new pedagogic or technology endeavor, as perceptions have a direct impact on how much effort students will put into educationally purposeful activities, which has direct implications for their learning as well (Buckley *et al.*, 2006; Rumreich & Kecskemety, 2019). Chung and McLarney (2000) contend that the

essential aim of the learning experience is to create value for students. As indicated by Ruiz-Mafe *et al.*, (2017) educational programs need to deliver value to students and achieve higher levels of satisfaction among them as satisfaction is higher when students believe the learning and teaching system they use meets their information requirements (Eom, 2014; Schöbel *et al.*, 2020). Since gamification can increase students' perceived value in their learning process, previous studies analyzed the utilitarian (Hong *et al.*, 2021; Ruiz-Mafe *et al.*, 2017), and hedonic (functionality, prestige, joy, and pride) value of GBL. Ledden and Kalafatis (2010) and Sampaio *et al.* (2012) assume five dimensions of value in HEIs: (a) functional value; (b) social value; (c) epistemic value; (d) emotional value; (e) conditional dimension.

In GBL context, **functional value** refers to students' perceptions that the GBL in HE, supports their career development. Some samples would be guaranteed future employment, a good salary, and promotions. Active learning methods like GBL encourage creativity while also assisting students in the development of skills that will increasingly influence their future employability and personal growth. Examples of global conceptual learning frameworks that emphasize the value of active learning in the development of skills related to content-knowledge learning that are essential for students to succeed in the fast-changing digital society (Murillo-Zamorano *et al.*, 2021).

The benefits obtained from GBL such as the ability to stimulate curiosity, provide novelty, or satisfy demand for knowledge are referred to as **epistemic value**. Students' perceptions of the usage of gamification in the teaching–learning setting have been investigated in other studies. According to the findings of Whitton and Langan (2019), students had a favorable assessment of this methodology's innovative potential and motivational effects. Other studies (Campillo-Ferrer *et al.*, 2020; González & Skultety, 2018; Mekler *et al.*, 2017; Lopes, 2014) have found that students are more engaged, autonomous, and committed to studying (Santos-Villalba *et al.*, 2020). If a gamified class activity is perceived by students to improve their knowledge, then this will contribute to whether they find the activity useful overall. One could argue that knowledge improvement and usefulness are identical since the major goal of education is to gain knowledge. As a result, a learning instrument can only be useful if it allows for knowledge improvement (Filippou *et al.*, 2018). Students believe that GBL is easier and more intuitive than traditional approaches, providing more knowledge and increasing their engagement and motivation (Connolly *et al.*, 2012); in fact, they have the opportunity to actively

participate in the instructional content, proving a more positive attitude toward learning in general and, in particular, to improve their academic performance (Silva *et al.*, 2021).

Emotional value is recognized by the feelings that are stimulated in the student in GBL, such as sentiments of pride and self-achievement. Emotional value can be defined as whether or not students are glad they took the course with GBL method and whether or not they find it fascinating. Happy and fun emotions have also been shown to improve optimistic thinking and problem-solving abilities, reduce stress, build emotional and physical resilience, and foster a bonding experience while increasing group belonging. For certain students, fun can be an internal motivator, allowing them to suspend social inhibitions and enter a state of relaxed alertness. A fun atmosphere also contributes to the creation of a secure environment in which to practice and make mistakes (Whitton & Langan, 2019). Students who are having fun while doing an assignment are more likely to be relaxed, which leads to greater learning ability. Supporting student social engagement is one solution to help boost student academic engagement (Filippou *et al.*, 2018).

Social value is reflected in students' perceptions that individuals who influence or are important to them believe that obtaining GBL is a good thing to do, and will allow them to be viewed favorably. Additionally, a numbers of studies assume that the opinion of reference groups can play an important part in the consumer's value judgment such as Ledden *et al.* (2011), Wellington & Sikes (2006), Jablonski (2001), Zambo *et al.* (2014), Conrey *et al.* (2020), Lin & Huang (2020), Chamillard & Braun (2000), Diemer *et al.*, (2012) Rumreich & Kecskemety, (2019), Hall (2019), Boud & Lee (2005), Pearson & Brew (2002) and Kemp *et al.* (2014).

GBL's situational variables that can influence its experience's value are named the **Conditional value**. This value comprises specific benefits such as teaching materials, number of students and so on.

Many studies have examined the impact of consumers' value co-creation on perceived value and, ultimately, organizational performance (Dean *et al.*, 2016; Dollinger *et al.*, 2018; Foroudi *et al.*, 2019). For instance, Chan *et al.*, (2010) indicated that the perceived value created incorporates economic value and relational value, which then are related to performance outcomes including customer satisfaction, employee job satisfaction, and job performance. Chen and Wang (2016)

discovered comparable results with economic, relational, and enjoyment values, and, ultimately, customer satisfaction, and customer loyalty as performance outcomes of client participation in value co-creation. Dong *et al.*, (2008) recognized customers' expectation to co-create value in the future as a performance outcome resulting from client commitment and perceived value (Tran & Vu, 2021). Based on the literature, we proposed the second hypothesis (Figure 3.2):

H2. Student co-creation behavior during GBL has an impact on student perception of value of GBL in HE.

Again, since co-creation behavior is divided into two sub-behaviors, namely, participation and citizenship behavior, each on with several sub-dimensions, we divided the main hypothesis on several sub-hypotheses accordingly.

H2a: Student participation behavior during GBL has an impact on student perception of value of GBL in HE.

H2a (1): Information seeking during GBL has an impact on student perception of:

- A. Functional value of GBL in HE*
- B. Epistemic value of GBL in HE.*
- C. Emotional value of GBL in HE.*
- D. Social value of GBL in HE.*
- E. Conditional value of GBL in HE.*

H2a (2): Information sharing during GBL has an impact on student perception of:

- a) Functional value of GBL in HE.*
- b) Epistemic value of GBL in HE.*
- c) Emotional value of GBL in HE.*
- d) Social value of GBL in HE.*
- e) Conditional value of GBL in HE.*

H2a (3): Responsible behavior during GBL has an impact on student perception of:

- a) Functional value of GBL in HE.*
- b) Epistemic value of GBL in HE.*
- c) Emotional value of GBL in HE.*
- d) Social value of GBL in HE.*

e) *Conditional value of GBL in HE.*

H2a (4): Personal interaction during GBL has an impact on student perception of:

a) *Functional value of GBL in HE.*

b) *Epistemic value of GBL in HE.*

c) *Emotional value of GBL in HE.*

d) *Social value of GBL in HE.*

e) *Conditional value of GBL in HE.*

H2b: Student citizenship behavior during GBL has an impact on student perception of value of GBL in HE.

H2b (1): Feedback during GBL has an impact on student perception of:

a) *Functional value of GBL in HE.*

b) *Epistemic value of GBL in HE.*

c) *Emotional value of GBL in HE.*

d) *Social value of GBL in HE.*

e) *Conditional value of GBL in HE.*

H2b (2): Advocacy during GBL has an impact on student perception of:

a) *Functional value of GBL in HE.*

b) *Epistemic value of GBL in HE.*

c) *Emotional value of GBL in HE.*

d) *Social value of GBL in HE.*

e) *Conditional value of GBL in HE.*

H2b (3): Helping behavior during GBL has an impact on student perception of:

a) *Functional value of GBL in HE.*

b) *Epistemic value of GBL in HE.*

c) *Emotional value of GBL in HE.*

d) *Social value of GBL in HE.*

e) *Conditional value of GBL in HE.*

H2b (4): Tolerant during GBL has an impact on student perception of:

a) *Functional value of GBL in HE.*

- b) Epistemic value of GBL in HE.
- c) Emotional value of GBL in HE.
- d) Social value of GBL in HE.
- e) Conditional value of GBL in HE.

Figure 3.2 represents these hypotheses.

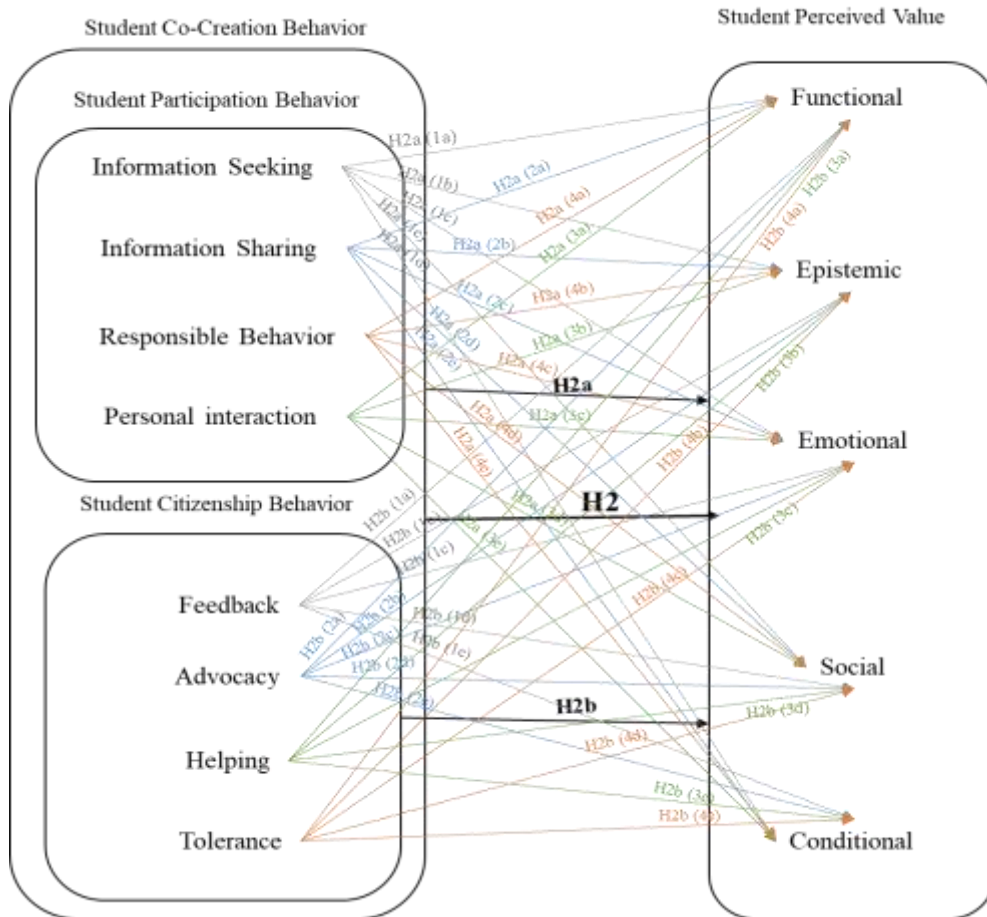


Figure 3.2. Hypothesis 2

Source: Own elaboration

Past research has looked at the link between student satisfaction and perceived value. A positive relationship between student perceived value and satisfaction and trust has been found (Halimatussakdiah *et al.*, 2018; Hume & Mort, 2010; Moliner *et al.*, 2007; Shukla, 2010; Elliott, 2002; O'Bannon *et al.*, 2011; Defranceschi & Ronchetti, 2011; Traphagan *et al.*, 2010; Lancaster *et al.*, 2011; Johnston *et al.*, 2013; Dickson *et al.*, 2012). The perceived value of students has an impact on their satisfaction (Ledden *et al.*, 2007; Brown & Mazzarol, 2009). Despite the fact that several

studies on the relationship between these variables have been conducted, the HE setting has received little attention (Brown & Mazzarol, 2009; Halimatussakdiah *et al.*, 2018). Hence, we are proposing the following hypothesis in the context of GBL in HE (Figure 3.3):

H3. Student perception of value of GBL has an impact on student satisfaction with GBL in HE.

Considering the different types of value that can exist, we divided the main hypothesis in several sub-hypotheses according to the types of value.

- H3a: Student perception of Functional value of GBL has an impact on student satisfaction with GBL*
- H3b: Student perception of Epistemic value of GBL has an impact on student satisfaction with GBL*
- H3c: Student perception of Emotional value of GBL has an impact on student satisfaction with GBL*
- H3d: Student perception of Social value of GBL has an impact on student satisfaction with GBL*
- H3e: Student perception of Conditional value of GBL has an impact on student satisfaction with GBL*

Figure 3.3 shows these hypotheses

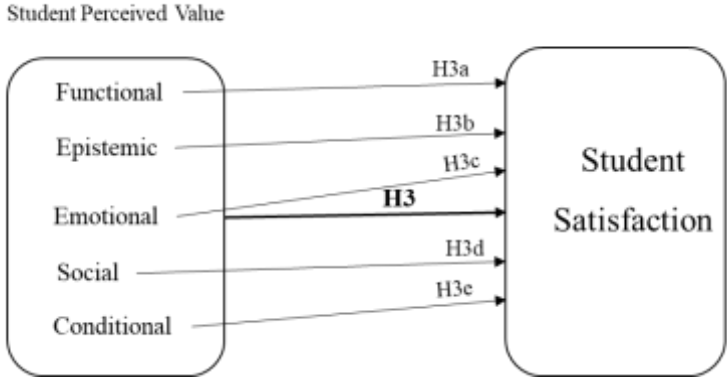


Figure 3.3. Hypothesis 3

Source: Own elaboration

The full model with proposed hypotheses can be summed up by the following model:

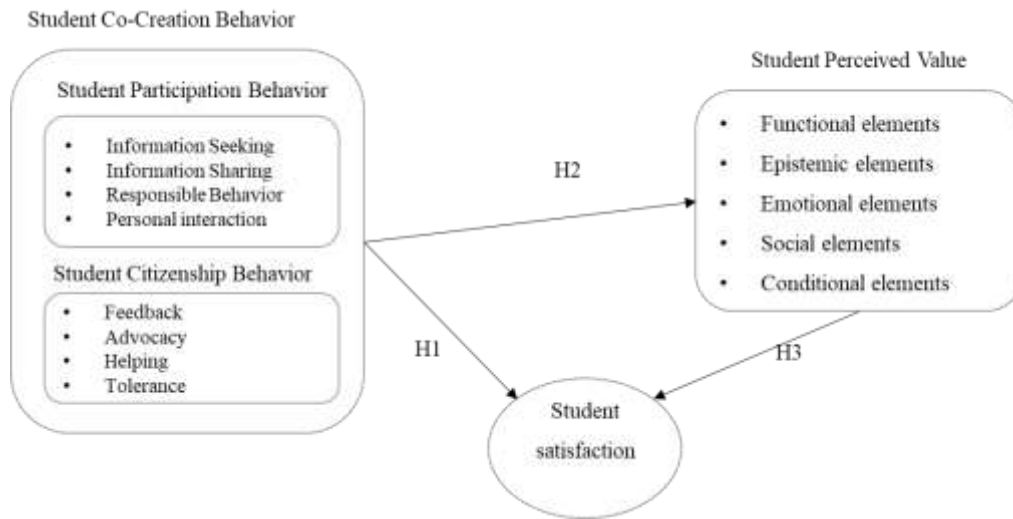


Figure 3.4. Research model

Source: Own elaboration

Chapter 4 Methodology

Abstract

This chapter presents the methodological approach used for this study. In order to present an adequate argument for the method adopted, first of all, there is a comprehensive discussion regarding the philosophical aspects of this thesis. Moreover, the chapter discusses the research method, which comprises research strategy, survey design, interview design and the justification for choosing the quantitative and qualitative research methods, and the available measurement scales which have been used in this thesis, and the reasons for our selections. In addition, the chapter explains the questionnaire used, the research population and sample and, finally, the type of empirical analyses used.

4.1. Philosophical aspects of research

On a philosophical level, different typologies of research can be used. Among these typologies is the risk related to blurring the qualification between research that mainly seeks to explore patterns with no a priori articulated hypotheses (exploratory research), and research that explicitly tests a priori formulated hypotheses (confirmatory research) (Nilsen *et al.*, 2020). McQuarrie (2019) also mentions exploratory and confirmatory research as the main two essential modes of doing market research.

As indicated by Jaeger and Halliday (1998), confirmatory research proceeds from a series of alternative, a priori hypotheses concerning some topic of interest, followed by the development of a research design (often experimental) to test those hypotheses, the gathering of data, analyses of the data, and ending with the researcher's inductive inferences. Since most research programs must rely on inductive (rather than deductive) logic, none of the alternative hypotheses can be proven to be valid; the hypotheses can only be refuted or not refuted.

Explicit hypotheses tested with confirmatory research generally do not spring from a scholarly void yet rather are often gained through exploratory research. Thus exploratory approaches to research can be utilized to create hypotheses that later can be tested with confirmatory approaches. While confirmatory research is often experimental (Platt, 1964), exploratory research

may be either experimental or observational. The end goal of exploratory research, though, is to gain new insights, from which new hypotheses might be developed. In the philosophy of science, this distinction has been widely discussed and following the classical paper by Platt (1964) on strong inference the importance of confirmatory research has been long appreciated (Nilsen *et al.*, 2020).

Based on the above, the research model adopted in the current thesis started with a previous exploratory study, based on interviews, and thus includes both exploratory studies and confirmatory studies to develop a set of hypotheses derived from prior studies about the relationship between student co-creation behavior and perception of value in the GBL environment in HE and student satisfaction.

4.2. QUALITATIVE RESEARCH DESIGN

Given the lack of research on student perceived value in GBL, qualitative data analysis was conducted to support the hypothesized affective outcomes of GBL. Leavy (2017) described qualitative research as inductive approaches to knowledge building aimed at generating meaning. Scientists utilize qualitative analysis to explore; and find out about social phenomena; to unpack the meanings individuals ascribe to activities, situations, events, or artifacts. The values underlying qualitative research incorporate the significance of individuals' subjective experiences and meaning-making processes and acquiring a depth understanding (Bryman & Bell, 2015). To explore the student perception of value of GBL from the lecturers' point of view, we started by conducting interviews with lecturers of a business academy in Denmark.

4.2.1. DATA COLLECTION

To fulfill the aim of the qualitative study, online informal semi-structured interviews were conducted. In semi-structured interviews the researcher has a list of themes and possibly some key questions to be covered, although their utilization may vary from interview to interview (Saunders *et al.*, 2017). Research interviews utilized for an explanatory purpose are useful in both inductive and deductive approaches because of the intention to explain why relationships exist. The selection of the sampling method depends on the nature of the research study (Rahi, 2017). Convenience sampling is a procedure of data collection from a population that is close at hand

and easily accessible to analysts. Two lecturers who are employing GBL in their teaching process at IBA (international business academy) were selected.

An interview guide was used to ensure that the same topics were covered in all the interviews (see appendix table 9.3). The goal of the interviews was to gain a good understanding of expected benefits from students, educators and the HEI from using games and simulation in their teaching process from the educators' points of view. They were also asked about the barriers and risks of using games and simulation in HE. The interviews took place on 17th December 2020 via Microsoft team application. The interviews lasted from 30 minutes to 1 hour, depending on the time available or the interest of the interviewees. Both interviewees were willing to have the interview audio recorded.

4.2.2. DATA ANALYSIS

The interviews were fully transcribed and revised carefully so as to determine their validity as objects of the study. In order to analyze the data, we made use of text analysis software QSR NVivo to organize, code according to themes, and analyze the data. NVivo is a program that allows for the structuring and analysis of text through coding, word frequency searches, and various visual and model presentations of the data. It is a tool that aids the researcher in interpreting the data (Bazeley, 2002). The transcribed interviews were imported to NVivo and coded. The codes were made based on the interview guide, but as the analyses of the texts developed, new codes emerged and were added. The interviews were reviewed for keywords and recurring themes through querying frequency, as well as coding according to themes that the interviewees discussed.

In the current thesis we include collecting, analyzing, and in some way integrating both quantitative and qualitative data. Creswell (2012) suggests that the scientist gathers both quantitative and qualitative data, examines both datasets separately, compares the outcomes from the analysis of both datasets, and makes translations regarding whether the outcomes support or contradict each other. The direct comparison of the two datasets by the researcher provides a combination of data sources (Subedi, 2016). Accordingly, pluralistic methodologists permit and emphasize utilizing both quantitative and qualitative research methods in a single study, to address the research question in the best possible way (Creswell & Plano-Clark, 2011;

Denscombe, 2010; Midgley *et al.*, 2017; Morgan, 2007)

4.3. QUANTITATIVE RESEARCH DESIGN

The quantitative research conducted in the thesis begins with the development and validation of the proposed scales, which is followed by the presentation of the measurement instrument used to assess the hypothesized theoretical models. Quantitative studies use numbers and large samples to test theories (Sobh & Perry, 2006). As indicated by Shafaq Shah *et al.* (2018), the quantitative and qualitative research approaches, embraced with distinctive attributes and guided by positivism and constructivism philosophical assumptions, are commonly utilized in social science research.

Quantitative research is portrayed by deductive approaches to the research process aimed at proving, disproving, or lending credence to existing theories. It is generally connected with positivism, particularly when utilized with predetermined and highly-structured data collection techniques (Bryman & Bell, 2015; Leavy, 2017).

4.3.1. Development of the questionnaire

The quantitative research was based on a survey. The survey was used to collect data to examine the students' perception of value of GBL in HE, their co-creation behavior during GBL and their satisfaction with GBL. The questionnaire contained four segments. Section A included question on student satisfaction with GBL experience. Segment B included questions on members' perceptions of the GBL experience value. Segment C of the poll involved questions on members' co-creation behaviors. Segment D of the poll concentrates on the participants' demographic data. The survey method guidelines of Creswell (2009) have been followed for designing the survey.

4.3.2. Scales:

As mentioned above, in order to conduct the empirical study, one survey for students was implemented. Existing scales were adapted to measure all of the studied concepts. Specifically, we have selected scales that have been well-validated and match the purpose of our thesis. However, the wording of the items was modified to be relevant to a sample of students and GBL.

The antecedents of student satisfaction were measured using Deng *et al.* (2010) scales. To measure students perception of value of using GBL we used LeBlanc and Nguyen (1999) and Ledden, Kalafatis and Samouel (2007) scales. And finally, co-creation behavior is a multidimensional third-order construct that was measured through customer participation behavior (information seeking, information sharing, responsible behavior, personal interaction) and customer citizenship behavior (feedback, advocacy, tolerance, and helping). The students co-creation behaviors in GBL environment were measured using Foroudi et al. (2020), Foroudi, Yu, Gupta, & Foroudi (2019), and Yi & Gong (2013) scales.

The respondents were asked to rate facets of their education experience, perceived value and co-creation using a seven-point Likert scale (1= strongly disagree, 7= strongly agree). More information about the used scales and the respective items is given in table 4.2

Table 4.2 shows the scales used to measure each factor in the study.

Factor	No. of items	Items	Scale
Student satisfaction	3	1. My feelings towards the game-based learning are very positive. 2. The experience that I have had with game-based learning has been satisfactory. 3. In general, I am satisfied with the game-based learning.	(Deng <i>et al.</i> , 2010) (Deng <i>et al.</i> , 2010) (Deng <i>et al.</i> , 2010)
Student perception of value Elements	24		
Functional elements	5	4. Using game-based learning in my education will allow me to earn a good salary. 5. The utilization of this game/simulation in my education will allow me to achieve my career goals. 6. The knowledge and skills I have acquired from this game/simulation will allow me to get promotions. 7. It is better to obtain courses used game/simulations before entering the workforce. 8. I believe employers are interested in hiring students who have experienced games and simulations in their education.	(LeBlanc & Nguyen, 1999) & (Ledden <i>et al.</i> , 2007) (LeBlanc & Nguyen, 1999) & (Ledden <i>et al.</i> , 2007) (LeBlanc & Nguyen, 1999) & (Ledden <i>et al.</i> , 2007) (LeBlanc & Nguyen, 1999) (LeBlanc & Nguyen, 1999)
Epistemic elements	5	9. The quality of Knowledge and skills received from these games/simulations influences the value of my degree. 10. Game/simulation influences the value of my education. 11. The number of students in groups using game/simulation influences the value of my education. 12. The guidance received from professors during the game/simulation affects the value of my education. 13. I learned new things from the game/simulation experience.	(LeBlanc & Nguyen, 1999) (LeBlanc & Nguyen, 1999) & (Ledden <i>et al.</i> , 2007) (LeBlanc & Nguyen, 1999) (LeBlanc & Nguyen, 1999) & (Ledden <i>et al.</i> , 2007) (LeBlanc & Nguyen, 1999) & (Ledden <i>et al.</i> , 2007)

Emotional elements	5	<p>14. I like participating in these games/simulations. (LeBlanc & Nguyen, 1999)</p> <p>15. I am glad that I chose a program that offers me this game/simulation. (LeBlanc & Nguyen, 1999)</p> <p>16. The value of these games/simulations depends on my personal effort. (LeBlanc & Nguyen, 1999) & (Ledden <i>et al.</i>, 2007)</p> <p>17. Taking these games/simulations has given me a sense of self-achievement. (Ledden <i>et al.</i>, 2007)</p> <p>18. Taking these games/simulations has boosted my self-confidence. (Ledden <i>et al.</i>, 2007)</p>
Social elements	5	<p>19. I am happy when playing these games/simulations with my classmates. (LeBlanc & Nguyen, 1999)</p> <p>20. I find the games/simulations more interesting when participating with groups of friends. (LeBlanc & Nguyen, 1999)</p> <p>21. Working in groups with games/simulations has a positive effect on the value of my education. (LeBlanc & Nguyen, 1999)</p> <p>22. Social activities in games/simulations make my studies more interesting. (LeBlanc & Nguyen, 1999)</p> <p>23. People who are important to me think that taking these games/simulations is a good thing to do. (Ledden <i>et al.</i>, 2007)</p>
Conditional elements	4	<p>24. The support materials supplied to me with the game/simulation on my course (e.g. study packs/texts) have helped my learning. (Ledden <i>et al.</i>, 2007)</p> <p>25. Study-group work in the game/simulation has been a beneficial part of my course (Ledden <i>et al.</i>, 2007)</p> <p>26. The game/simulation and its facilities have contributed to the value of my course (Ledden <i>et al.</i>, 2007)</p> <p>27. The convenience of the game/simulation location (online) has contributed to the value of my course (Ledden <i>et al.</i>, 2007)</p>
Consumer Co-creation behavior		
Customer participation behavior	15	
Information seeking	3	<p>28. I have asked others for information on what simulations/ games the institution offers. (Foroudi <i>et al.</i>, 2020; Foroudi <i>et al.</i>, 2019; Yi & Gong, 2013)</p> <p>29. I have paid attention to how others behave to use these games/ simulations well. (Foroudi <i>et al.</i>, 2020; Foroudi <i>et al.</i>, 2019; Yi & Gong, 2013)</p> <p>30. I have searched for information on where these games/ simulation are located. (Foroudi <i>et al.</i>, 2020; Foroudi <i>et al.</i>, 2019; Yi & Gong, 2013)</p>
Information sharing	4	<p>31. I clearly explained what I wanted the lecturer to provide me regarding using the game in this course. (Foroudi <i>et al.</i>, 2020; Foroudi, Yu, Gupta, & Foroudi, 2019; Yi & Gong, 2013)</p> <p>32. I gave the lecturer proper information. (Foroudi <i>et al.</i>, 2020; Foroudi <i>et al.</i>, 2019; Yi & Gong, 2013)</p> <p>33. I provided the necessary information related to the game so that the lecturer could perform his or her duties. (Foroudi <i>et al.</i>, 2020; Foroudi <i>et al.</i>, 2019; Yi & Gong, 2013)</p> <p>34. I answered all the institution's game-based learning service-related questions. (Foroudi <i>et al.</i>, 2020; Yi & Gong, 2013)</p>
Responsible behavior	4	<p>35. I fulfilled my responsibilities to the games/ simulations. (Foroudi <i>et al.</i>, 2020; Foroudi <i>et al.</i>, 2019; Yi & Gong, 2013)</p> <p>36. I adequately completed all the expected behaviors. (Foroudi <i>et al.</i>, 2020; Foroudi <i>et al.</i>, 2019; Yi & Gong, 2013)</p> <p>37. I performed all the tasks that are required. (Foroudi <i>et al.</i>, 2020; Foroudi <i>et al.</i>, 2019; Yi & Gong, 2013)</p> <p>38. I followed the lecturer's directives or orders during the games/simulations. (Foroudi <i>et al.</i>, 2020; Yi & Gong, 2013)</p>
Personal interaction	4	<p>39. I was friendly to the lecturer and other students. (Foroudi <i>et al.</i>, 2020; Foroudi <i>et al.</i>, 2019; Yi & Gong, 2013)</p>

		40. I didn't act rudely to the lecturer and other students.	(Foroudi <i>et al.</i> , 2020; Foroudi <i>et al.</i> , 2019; Yi & Gong, 2013)
		41. I was courteous to the lecturer and other students.	(Foroudi <i>et al.</i> , 2020; Yi & Gong, 2013)
		42. I was kind to the lecturer and other students.	(Foroudi <i>et al.</i> , 2020; Foroudi <i>et al.</i> , 2019; Yi & Gong, 2013)
Clients citizenship behavior	13		
Feedback	3	43. When I experience a problem using the games/simulation, I let the lecturer know.	(Foroudi <i>et al.</i> , 2020; Foroudi <i>et al.</i> , 2019; Yi & Gong, 2013)
		44. If I have a useful idea on how to improve the games/simulations, I let the lecturer know.	(Foroudi <i>et al.</i> , 2020; Foroudi <i>et al.</i> , 2019; Yi & Gong, 2013)
		45. When I receive good service from the institution staff regarding the utilization of the games/simulations, I comment about it.	(Foroudi <i>et al.</i> , 2020; Foroudi <i>et al.</i> , 2019; Yi & Gong, 2013)
Advocacy	3	46. I said positive things about the games/ simulations, the course and the institution to others.	(Foroudi <i>et al.</i> , 2020; Foroudi <i>et al.</i> , 2019; Yi & Gong, 2013)
		47. I encouraged friends and relatives to attend the course in the institution and take the games/simulations.	(Foroudi <i>et al.</i> , 2020; Foroudi <i>et al.</i> , 2019; Yi & Gong, 2013)
		48. I recommended the games/ simulations, the course and the institution to others.	(Foroudi <i>et al.</i> , 2020; Foroudi <i>et al.</i> , 2019; Yi & Gong, 2013)
Helping	4	49. I assist other students if they need my help in games/simulations.	(Foroudi <i>et al.</i> , 2020; Foroudi <i>et al.</i> , 2019; Yi & Gong, 2013)
		50. I help other students if they seem to have problems in games/ simulations.	(Foroudi <i>et al.</i> , 2020; Foroudi <i>et al.</i> , 2019; Yi & Gong, 2013)
		51. I teach other students to use the games/ simulations correctly.	(Foroudi <i>et al.</i> , 2020; Foroudi <i>et al.</i> , 2019; Yi & Gong, 2013)
		52. I give advice to other students.	(Foroudi <i>et al.</i> , 2020; Yi & Gong, 2013)
Tolerant	3	53. If the games/ simulations are not delivered as expected, I would be willing to put up with it.	Foroudi <i>et al.</i> , 2020; Foroudi <i>et al.</i> , 2019; Yi & Gong, 2013)
		54. If the games/ simulations have a mistake during service delivery, I would be willing to be patient.	Foroudi <i>et al.</i> , 2020; Foroudi <i>et al.</i> , 2019; Yi & Gong, 2013)
		55. If I have to wait longer than I normally expected to receive the service related to the games/ simulations, I would be willing to adapt.	Foroudi <i>et al.</i> , 2020; Foroudi <i>et al.</i> , 2019; Yi & Gong, 2013)

Table 4.2. Scales used to measure each factor in the study.

Source: own elaboration

4.3.3 PRETEST

The questionnaire was created in English, the poll was not too long or time-consuming (Alalwan, Dwivedi, Rana, & Algharabat, 2018). Furthermore, a pilot test was conducted with five IBA's students of different educational levels to check whether any changes should be made to the survey before utilizing it for the main study and to ensure that the questionnaire was user-friendly. The majority of the respondents assured the suitability and clarity of the language utilized.

4.3.4 SAMPLING AND DATA COLLECTION

Our target population was students. Convenience sampling is a procedure of data collection from a population that is close at hand and easily accessible to analysts. Convenience sampling

permits specialists to complete interviews or get responses in a cost-effective way however they may be criticized for selection bias because of the difference of the target population (Rahi, 2017; Saunders *et al.*, 2017). Practically, the convenience sample is going to be reached by approaching the students in their own education environments, for example, Master's degree, Ph.D. and Bachelor's degree students in a number of the universities and educational institutes.

We have contacted 4 HEIs via email and social media platforms, and received help from two HEIs to announce the questionnaire. The questionnaire was applied online through survey monkey and in a way that allowed the respondents to submit their answers only if fully completed. Finally, data collection took place between 21 February 2021 and 21 April 2021. The study's population was the students of two HEIs in Denmark, International Business Academy (IBA) (Kolding), University of Southern Denmark (SDU), and the University of Minho in Portugal. These HEIs offer a range of different GBL methods in their programs.

4.3.5. DATA ANALYSIS

The data were analyzed utilizing the Statistical Package for Social Sciences (SPSS 27.0) and Smart PLS. Descriptive measurements were employed to establish a statistical profile of the respondents.

For testing the hypotheses, we have used Structural Equation Modelling (SEM). When analyzing data two different types of models have to be considered: reflective and formative models (Hair *et al.*, 2017). The difference between a reflective and a formative construct lies in the direction of the causality of its indicators. The reflective view assumes that the latent variable are correlated indicators, while the formative approach posits that the indicators form the construct (Coltman *et al.*, 2008). Importantly, the measurement model validation procedures associated with the two approaches are different. The two processes mainly differ in terms of the statistical evaluation criteria, as reliability and construct validity for reflective constructs are not directly applicable to formative measurement models (Diamantopoulos & Winklhofer, 2001).

Based on the above arguments, and applying the criteria established by Jarvis *et al.* (2003), Student perception of value is conceptualized as a higher-order formative construct (Jarvis *et al.*, 2003). Perceived value is defined as a formative second-order construct which is constituted

by its first-order value sub-constructs.

Customer value co-creation behavior is viewed as a third-order factor in this study. More specifically, the two components of customer participation behavior, customer citizenship behavior, and customer value co-creation behavior would add algebraically to produce the third-order customer value co-creation behavior. The eight first-order dimensions, on the other hand, are behavioral expressions of each second-order aspect (consumer participation behavior or citizenship behavior), implying that the model is reflective in nature (Yi & Gong, 2013). This work used component-based structural equation modeling (PLS, specifically Smart-PLS 2.0 M3) to test the third-order factor structure (Ringle et al., 2005). Hierarchical component modeling was used in this study (Wetzels et al., 2009).

4.3.5.1. Two-step approach

Higher-order constructs, which make it easier to represent a construct on a more theoretical higher-level dimension and its more concrete lower-order sub dimensions, have become more common in partial least squares structural equation modeling applications (PLS-SEM). To find the higher-order construct, researchers can use a variety of methods. The repeated indicators technique or the two-stage approach are two popular approaches (Sarstedt, Hair, Cheah, Becker, & Ringle, 2019). In fact, two versions of the two-stage approach have been suggested in research: (1) the embedded two-stage approach (Christian M. Ringle, Sarstedt, & Straub, 2012) and (2) the disjoint two-stage approach (Agarwal & Karahanna, 2000; Becker, Klein, & Wetzels, 2012), which differ slightly in the model formulation in both stages. For example, although the embedded approach models the full higher-order construct at first, the disjoint approach starts with only the lower-order components. There is no justification to select one variant of the two-stage strategy over the other since both provide similar results (Cheah et al., 2019)). To analyze the current thesis data, we employ the disjoint three-stage approach, since the co-creation construct includes first, second and third-order dimensions to illustrate the specification, estimation, and validation of the reflective-reflective and reflective-formative types of higher-order constructs.

The disjoint two-stage approach varies from the embedded two-stage approach in the specification of both stages. Rather than using the repeated indicators approach in stage one, the disjoint two-stage approach considers only the lower-order components of the higher-order construct (without the higher-

order component) in the path model. These are directly linked to all other constructs that the higher-order construct is theoretically related to. To execute the disjoint two-stage approach, we save the construct scores, but only those of the lower-order components. In stage two, these scores (latents) are then used to measure the higher-order construct. Yet, diverse from the embedded two-stage approach, all other constructs in the path model are assessed using their standard multi-item measures as in stage one (Sarstedt *et al.*, 2019).

4.3.5.2. Sample characteristics

417 answers were collected through the survey. However, only completed and valid answers from Danish and Portuguese HEIs were selected, and the final sample size in the study is 356. Table 4.3. shows the sample characteristics for the study.

Demographics Categories	Frequency	Percentage
Gender		
Female	163	46%
Male	193	54%
Age		
Less than 20	2	1%
21-25	117	33%
26-30	109	31%
31-35	126	35%
More than 35	2	1%
Country of origin		
India	59	17%
Denmark	54	15%
Iran	35	10%
Bangladesh	25	7%
Brasil	10	3%
Germany	23	6%
France	20	6%
Netherland	13	4%
Poland	13	4%
Portugal	18	5%
Estonia	11	3%
Latvia	11	3%
Sweden	11	3%
Czechia	10	3%
Italy	9	3%

Bulgaria	7	2%
Lithuania	7	2%
Hungary	5	1%
Romania	4	1%
Moldova	3	1%
Spain	8	2%
School names		
IBA	262	74%
SDU	58	16%
University of Minho	36	10%
Program		
International business and marketing	58	16%
International sales and marketing management	84	24%
Multimedia Design and Communication	66	19%
Top up Bachelor	112	31%
Product Design	2	1%
Art and Design	3	1%
Industrial Engineering	8	2%
Marketing	10	3%
Marketing and Strategy	13	4%
Courses		
Foundation of strategy	59	17%
Graphic design, aesthetics, 3D animation and audio	28	8%
International marketing management	112	31%
IT systems, data communication, and building websites	19	5%
Marketing and marketing strategy	56	16%
Organization	36	10%
Video	17	5%
Product Design	12	3%
Building websites	5	1%
Digital Marketing	7	2%
X-culture	5	1%
Last game-based learning method		
Digital educational games and applications	124	35%
Simulation	196	55%
Dynamic learning methods	36	10%

Table 4.3. Sample demographics

Source: Own elaboration

According to the demographic analysis, most of the participants (35%) are aged between 31-35 years old. As can be seen in table 4.3, 54 percent of the sample are males and 46 percent are females. Most of participants are from India (59 participants), followed by Denmark (54 participants), Iran (35 participants), Bangladesh (25 participants), Germany (23 participants) and France (20 participants). According to the analysis, participants mentioned the name of schools in which they participated last in the GBL experience. 74 percent of participants are student at IBA while 16 percent of participants are students at SDU and 10 percent of participants are students at the University of Minho.

According to the analyzed data, 31 percent of participants were/are taking in “Top up Bachelor”, 24 percent in “International sales and marketing management”, 19 percent in “Multimedia Design and Communication” and finally, 16 percent in “International business and marketing” and 11 percent in different other programs when they participated in the last GBL experience. Participants were participating in a variety of courses in the areas of management, marketing and communication and technology, including 31 percent of participants (112 students) in the “International marketing management” course, 17 percent of participants (59 students) in the “Foundation of strategy” course and 16 percent of participants (56 students) in the course of “Marketing”.

In the research questionnaire, participants were asked to indicate “the last game-based learning that you have/are participated/participating in”. According to the analyzed data, 55 percent answered “Simulation”, 35 percent specified the “Digital educational games and applications” and 10 percent “Dynamic learning methods “as their last GBL course.

4.4.CONCLUSION

This chapter clarifies the philosophical and methodological parts of the current thesis and exhibits its confirmatory nature (Zikmund *et al.*, 2010). Second, we discuss and provide justifications for the use of questionnaires used for data collection. In addition, the authors examine the scales followed to measure the studied variables and clarify the reason behind adopting specific scales that suit the nature of the thesis and its objectives. Further, this chapter discusses the techniques followed in conducting a pre-test to comprehension issues. Additionally, the authors explain the data collection procedures. This chapter additionally explains the research techniques followed in examining the

overall research model.

Chapter 5 Data analysis

5.1. Introduction

Data analysis, assessment of the measurement model and test of hypotheses are presented in this chapter. We start with the presentation of the qualitative data analysis and then proceed to the quantitative data analysis, where we present the results from the questionnaire and test the proposed hypothesis using Structural Equation Modelling.

5.2. Qualitative Data Analysis

A picture for data analysis was developed using two interviews' voice recordings, and transcriptions. The data analysis procedures followed ranged from developing resources, to coding by nodes and running queries to produce conclusion. Graphs and charts developed by running code matrix queries were transferred directly to Microsoft Word, and some were developed using NVivo. The transcribed interviews were imported to NVivo and coded.

Initial or open coding is used in the early stages of qualitative data analysis to expose the text to close scrutiny. To construct theories from data, open and axial coding processes require breaking down data, analyzing it, and reconstructing it in creative ways (Welsh, 2002). Before using NVivo, some coding was done manually in this research study. The interview guide was also used for coding. During the coding process, it was discovered that various value and benefits expected by the educators were perceived by their student during GBL, mainly, enjoyment, social value, condition of the GBL, and emotion. The codes were made based on the interview guide (see appendix table 9.3), but as the analyses of the texts developed, new codes emerged and were added (see table 4.1).

Main code	Sub code
Barriers for students	The cost of simulation and game
	Confidence
	Employability
Benefits and values for students	Enjoyment
	Freedom
	Location-situation of games and simulations
	Materials

	New knowledge and skills
	Academic performance
	Positive emotion
	Practical learning
	Risk free
	Self-awareness
	Self-confidence
	Self-efficacy
	Socialization with groupmates
	Student identification
	Support from supervisors
	Team working
	Trust
	Student collaboration with others
	Competitive advantage
	Facilities
	Feedback from the students
	Inspiration for teachers
	Share knowledge
	Differentiation
Benefits for HEI	

Table 5.1. Codes developed in NVivo for the analyses

Source: own elaboration

The interviews were reviewed for keywords and recurring themes through querying frequency, as well as coding according to themes that the interviewees discussed (Figure 5.1 and 5.2).

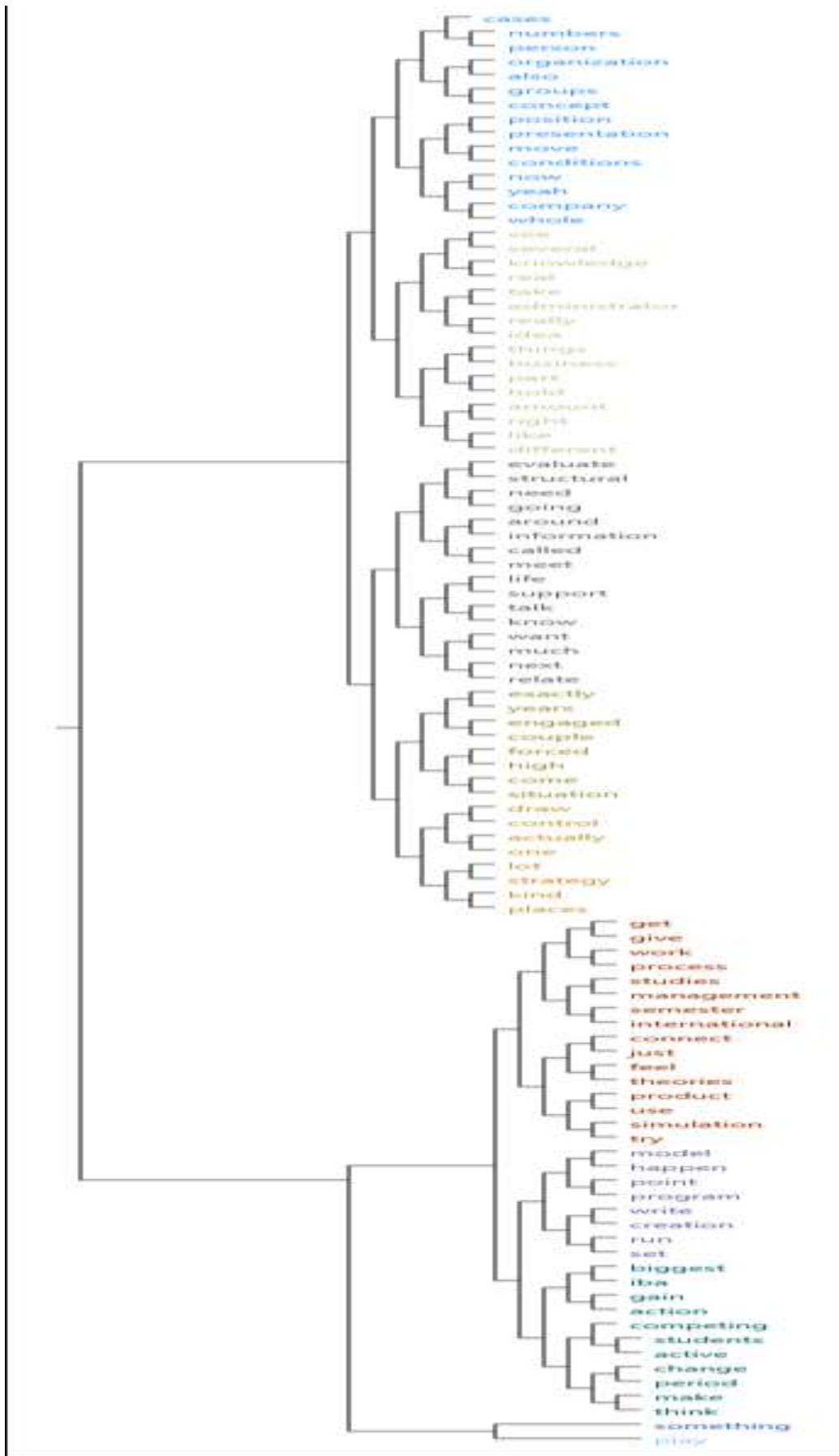


Figure 5.2. Cluster Analysis of coded material using word similarity

Source: Own elaboration

This cluster analysis and the Querying frequency cover almost all the propositions developed after analysis. For example, that student, as an actor, having the main role in their learning process. The specific value of the simulation expected by these interviewers (lecturers) that perceived by student related to the emotional, social, condition, and functional value. They play an active role and co-create the value of their education. Students share knowledge, committing with other groups and improving their knowledge and skills. The HEI receive feedback from the students, differentiate itself from the competitors. Cluster analysis is used to identify the major themes emerging from the coded material using word similarity in the sources.

5.3. Quantitative Data Analysis

5.3.1. Descriptive Analysis

5.3.1.1. Examination of Data Entry and Missing Data

The quantitative data analysis started with the investigation of data entry. Hair *et al.* (2017) stated that it is relevant to gain some critical insights into the data characteristics and analysis. Accordingly, in order to gain a high level of accuracy in the data entry process, a double-check was performed. According to Hayes, (2005), data screening “is the process of examining the data file for errors in the data file itself” (p. 79). Hayes proposes that data screening is essential to ensure that data are accurate and research conclusions are correct. All entries were confirmed case by case in the first check, then the descriptive statistics including frequency distribution, mean and standard deviation were conducted and confirmed. The frequency distribution yielded no mistakes in the data entry. The accuracy of the data entered into the data set was 100%.

5.3.1.2. The normality assessment

In the initial analyses, the individual responses to the items were screened to determine if there was substantial skewness or kurtosis, as well as inspected for outliers. The absolute value for kurtosis is 2.2, which is considered acceptable to indicate normal univariate distribution (Vinet & Zhedanov, 2010). The absolute value of skewness is 1.5 or lower, which indicates that data is normally distributed. An absolute value of more than 1.5 indicates the distribution of that

variable has departed from normality. The values of skewness and kurtosis for all items were acceptable. In addition, Hayes (2005) states that the data screening process starts by generating a table of minimum and maximum values to find any errors in the data. The items were measured using a 7-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree), a minimum and maximum values showed that the data were between the 1 and 7 range, which suggested no errors in the data (see appendix 9.4).

5.3.1.3. Descriptive analysis of items

After the screening analysis, a descriptive analysis is been utilized to specify the general information about the data for each variable (Table 5.2).

		N	Mean	Std. Error	Std. Deviation	Variance
		Statistic	Statistic	Statistic	Statistic	Statistic
Student Satisfaction	Item 1	356	4.1376	0.0410	0.7732	0.598
	Item 2	356	3.9972	0.0401	0.7562	0.572
	Item 3	356	4.1208	0.0426	0.8046	0.647
Functional Value	Item 4	356	4.3090	0.0396	0.7468	0.558
	Item 5	356	4.3287	0.0408	0.7701	0.593
	Item 6	356	4.2022	0.0420	0.7933	0.629
	Item 7	356	4.3820	0.0400	0.7544	0.569
	Item 8	356	4.1657	0.0409	0.7714	0.595
	Item 9	356	4.1657	0.0424	0.8000	0.640
	Item 10	356	4.1236	0.0445	0.8401	0.706
	Item 11	356	4.1376	0.0431	0.8123	0.660
Epistemic Value	Item 12	356	4.1124	0.0430	0.8110	0.658
	Item 13	356	4.5590	0.0315	0.5952	0.354
	Item 14	356	4.6994	0.0243	0.4591	0.211
	Item 15	356	4.7416	0.0236	0.4448	0.198
Emotional Value	Item 16	356	4.7388	0.0250	0.4709	0.222
	Item 17	356	4.7472	0.0244	0.4604	0.212
	Item 18	356	4.6854	0.0253	0.4770	0.228
Social Value	Item 19	356	4.7135	0.0365	0.6895	0.475
	Item 20	356	4.6292	0.0329	0.6213	0.386
	Item 21	356	4.6994	0.0296	0.5588	0.312
	Item 22	356	4.6629	0.0325	0.6134	0.376
	Item 23	356	4.6096	0.0386	0.7291	0.532

		Item 24	356	4.6292	0.0291	0.5492	0.302
	Conditional Value	Item 25	356	4.7360	0.0274	0.5178	0.268
		Item 26	356	4.7219	0.0286	0.5399	0.291
		Item 27	356	4.7303	0.0273	0.5149	0.265
		Item 28	356	4.1545	0.0421	0.7952	0.632
	Information seeking	Item 29	356	4.4607	0.0418	0.7880	0.621
		Item 30	356	4.1826	0.0389	0.7338	0.538
		Item 31	356	4.0590	0.0480	0.9066	0.822
	Information sharing	Item 32	356	4.1348	0.0424	0.8006	0.641
		Item 33	356	3.8848	0.0421	0.7948	0.632
		Item 34	356	4.5646	0.0346	0.6533	0.427
		Item 35	356	4.6067	0.0319	0.6027	0.363
Customer participation behavior	Responsible behavior	Item 36	356	4.6180	0.0298	0.5618	0.316
		Item 37	356	4.5899	0.0323	0.6101	0.372
		Item 38	356	4.5815	0.0338	0.6383	0.407
		Item 39	356	4.4944	0.0314	0.5934	0.352
	Personal interaction	Item 40	356	4.4719	0.0435	0.8200	0.672
		Item 41	356	4.4410	0.0394	0.7426	0.551
		Item 42	356	4.5056	0.0322	0.6074	0.369
		Item 43	356	4.6180	0.0270	0.5092	0.259
	Feedback	Item 44	356	4.6152	0.0284	0.5368	0.288
		Item 45	356	4.4635	0.0306	0.5778	0.334
		Item 46	356	4.2893	0.0451	0.8512	0.725
	Advocacy	Item 47	356	4.1770	0.0494	0.9312	0.867
		Item 48	356	4.1685	0.0497	0.9373	0.879
		Item 49	356	4.3792	0.0437	0.8253	0.681
Customer citizenship behavior	Helping	Item 50	356	4.3680	0.0485	0.9144	0.836
		Item 51	356	4.4185	0.0493	0.9294	0.864
		Item 52	356	4.4073	0.0408	0.7690	0.591
		Item 53	356	4.2331	0.0452	0.8519	0.726
	Tolerant	Item 54	356	4.4719	0.0433	0.8166	0.667
Item 55		356	4.3371	0.0464	0.8746	0.765	

Table 5.2, Descriptive analysis of student satisfaction and perception of value and co-creation behavior
Source: Own elaboration

In terms of the student satisfaction scale, the highest mean belongs to item 1 with 4.14. The mean for item 2 is the lowest at 3.99. While, the standard deviation (SD) of item 3 is higher than other items.

Functional value items descriptive analysis illustrates that the mean for item 7 is 4.382 which

is the highest mean when compared to the other items in this group of items and item 8 has the lowest mean. The standard deviation of item 4 is less than other items. While, item 6 has the highest Standard Deviation (SD) (0.79). Additionally, in the epistemic items group, the mean for item 13 is 4.56 and higher than items 9 to 12. However, this item has the lowest SD (0.59). Item 10 has the highest SD with 0.84.

The mean for items 16 and 17 are almost the same and they are respectively 4.74. The SD of Item 18 is the highest in this group of items (Emotional value). Furthermore, the highest mean between items 19-23 is related to item 19. While, item 23 has the highest SD of 0.72 (Social value). The items between 24-27 related to the conditional elements the mean for item 25 is 4.74 is the highest. The SD of item 27 is less than other items and it is 0.51. While, item 24 SD is 0.55.

Items number 28-30 are related to information-seeking items, In this group, the mean for item 29 is 4.46. However, the SD 30 is less than other items and is 0.73. Item 28 has the highest SD. Moreover, item 31 of the information-sharing items has the highest SD. And, item 34 has the highest mean (4.59).

Among items 35-38 (Responsible behavior), the mean for items 36 is 4.62. The standard deviation of item 36 is less than other items and it is 0.56, while, item 38 has the highest SD. The highest mean in the group of items related to personal interaction belongs to item 42 (4.50). The standard deviation of item 39 is less than other items and it is 0.59.

The mean for item 43 is 4.62. The standard deviation of item 43, however, is the lowest in this group (43-45 feedback). The variance and standard deviation of item 48 are higher than other items (46-48 Advocacy) and it is 0.87 and 0.94. In Helping group of items, the mean for item 51 is 4.42. The standard deviation of item 52 is less than other items and it is 0.77. While item 51 has the highest SD, 0.91. Finally, item 54, with the highest mean (4.47) has the least SD (0.82) in the Tolerant group of items.

5.3.2. Assessment of the measurement model

The reflective measurement models' psychometric qualities were assessed by looking at

convergent validity, internal consistency, and discriminant validity through Smart PLS estimation. Convergent validity was evaluated by the strengths of the items' loadings (indicator reliability) and the average variance extracted (AVE). Moreover, multicollinearity and the importance and relevance of the outer weights were analyzed to assess the quality of the third order formative measurement models, which are formed of customer participation behavior and participation behavior construct. The bootstrap approach (1000 sub-samples) was used to examine the significance of the loadings based on the t-statistic values produced. The average variance was also checked against 0.50 value, which indicates convergent validity (Fornell & Larcker, 1981). Cronbach's alpha coefficient (Cronbach, 1951) and composite reliability (Werts, Linn, & Jöreskog, 1974) were used to assess internal consistency.

We employ the disjoint (Sarstedt *et al.*, 2019) three-stage approach as explained previously since co-creation includes first, second and third-order dimensions to illustrate the specification, estimation, and validation of the reflective-reflective and reflective-formative types of higher-order constructs.

5.3.2.1. At the first stage

At the first stage, all the first order indicators (items) are in reflective format. Reliability refers to the degree to which a set of indicators of a latent construct is internally consistent based on how highly interrelated the indicators are; It represents the extent to which they all measure the same thing (Hair et al., 2017). The assessment for reliability can be made using the Cronbach's alpha criteria, CR and Rho - values of 0.7 or higher are considered good, based on Simon (2007) and Fornell and Larcker (1981). The strength of the item loadings (indicator reliability) and the AVE were used to assess convergent validity (AVE). The loadings of the analyzed items ranged from 0.7, which is significantly over the recommended minimum level of 0.6 for exploratory studies such as the one we are developing (Fornell and Larcker, 1981). While, all the identified components except items No. 4, 5, 8, 9, 10, 12, 14, 18, 26, and 34 that these items omitted from the construct, as shown in Tables 5.3.

In summary, the reliability coefficients for the four constructs employed in the study exceed the minimum threshold value of 0.7 suggested by Simon (2007) (Table 5.3).

	Loading	T Statistics (O/STDEV)	Cronbach's Alpha	rho_A	Composite Reliability	(AVE)
student satisfaction			0.744	0.754	0.854	0.661
Item 1	0.772	13.011				
Item 2	0.814	16.207				
Item 3	0.850	17.543				
Functional			0.482	0.494	0.793	0.657
Item 6	0.768	8.058				
Item 7	0.852	11.302				
Epistemic			0.483	0.504	0.792	0.656
Item 11	0.753	3.753				
Item 13	0.864	5.805				
Emotional			0.719	0.760	0.839	0.636
Item 15	0.721	10.387				
Item 16	0.862	20.404				
Item 17	0.803	14.990				
Social			0.885	0.963	0.908	0.666
Item 19	0.919	35.243				
Item 20	0.706	10.801				
Item 21	0.848	15.680				
Item 22	0.772	14.890				
Item 23	0.818	23.015				
Conditional			0.683	0.704	0.818	0.600
Item 24	0.793	7.776				
Item 25	0.817	8.382				
Item 27	0.709	7.505				
Information seeking			0.741	0.770	0.850	0.655
Item 28	0.833	28.026				
Item 29	0.739	15.757				
Item 30	0.851	32.323				
Information sharing			0.821	0.875	0.890	0.729
Item 31	0.888	50.110				
Item 32	0.854	37.026				
Item 33	0.818	24.870				
Responsible behavior			0.866	0.900	0.906	0.708
Item 35	0.866	26.560				
Item 36	0.866	23.080				
Item 37	0.790	19.122				
Item 38	0.842	22.588				

Personal interaction			0.867	0.933	0.903	0.702
Item 39	0.801	8.387				
Item 40	0.910	12.606				
Item 41	0.758	7.809				
Item 42	0.874	10.101				
Feedback			0.699	0.757	0.828	0.618
Item 43	0.714	7.291				
Item 44	0.881	14.048				
Item 45	0.755	7.808				
Advocacy			0.792	0.793	0.878	0.706
Item 46	0.836	9.648				
Item 47	0.845	8.762				
Item 48	0.839	8.949				
Helping			0.749	0.761	0.841	0.570
Item 49	0.710	13.495				
Item 50	0.798	22.297				
Item 51	0.791	19.350				
Item 52	0.716	11.968				
Tolerant			0.709	0.716	0.837	0.631
Item 53	0.783	10.498				
Item 54	0.826	15.737				
Item 55	0.772	12.318				

Note: AVE= Average Variance Extracted

Table 5.3. Assessment of the measurement stage 1 model for the reflective constructs

Finally, the Average Variance Extracted (AVE) was carried out to test the convergent validity. The convergent validity was acceptable since the AVE was over 0.500. Cut-off values for reliability analysis, composite reliability, and AVE analyses have been adopted from Fornell and Larcker (1981).

Discriminant validity was assessed by Fornell and Larcker (1981) criterion, the table 5.4 shows that square-root of AVE for the construct was greater the inter-construct correlation. Discriminant validity was also assessed with heterotrait-monotrait ratio of correlations. The results show that the constructs are not highly related and correlated to each other (see table. 5.4).

	Advocacy	Conditional	Emotional	Epistemic	Feedback	Functional	Helping	Information seeking	Information sharing	Personal interaction	Responsible behavior	Social	Student satisfaction	Tolerant
Advocacy	0.840													
Conditional	0.064	0.775												
Emotional	-0.014	0.035	0.797											

Epistemic	0.061	0.045	-0.005	<i>0.810</i>										
Feedback	0.038	0.150	0.111	0.013	<i>0.786</i>									
Functional	-0.070	0.016	0.100	0.113	0.121	<i>0.811</i>								
Helping	0.015	0.100	0.088	-0.123	0.037	0.051	<i>0.755</i>							
Information seeking	-0.065	0.073	0.116	-0.088	0.024	0.063	-0.027	<i>0.809</i>						
Information sharing	-0.024	0.002	0.040	-0.039	0.064	0.068	-0.037	0.347	<i>0.854</i>					
Personal interaction	-0.127	-0.017	0.052	-0.004	0.068	0.046	0.087	-0.028	0.013	<i>0.838</i>				
Responsible behavior	-0.054	-0.062	0.049	0.092	-0.052	0.147	0.048	0.044	0.028	0.017	<i>0.841</i>			
Social	0.021	0.002	0.016	0.112	-0.007	0.036	0.003	-0.145	-0.110	-0.017	-0.018	<i>0.816</i>		
Student satisfaction	0.000	-0.087	-0.160	0.027	-0.033	-0.093	0.019	0.014	0.000	-0.079	-0.044	0.015	<i>0.813</i>	
Tolerant	-0.066	0.103	0.051	0.009	-0.003	0.041	0.178	-0.009	-0.068	0.024	0.002	0.072	-0.005	<i>0.794</i>

Note: Values in Italic represent Square= root AVE

Table 5.4. Discriminant validity
HTMT Ratios are less than 0.9 (see table. 5.5).

	Advocacy	Conditional	Emotional	Epistemic	Feedback	Functional	Helping	Information seeking	Information sharing	Personal interaction	Responsible behavior	Social	Student satisfaction	Tolerant
Advocacy														
Conditional	0.104													
Emotional	0.050	0.084												
Epistemic	0.128	0.147	0.070											
Feedback	0.053	0.190	0.142	0.069										
Functional	0.126	0.072	0.178	0.233	0.204									
Helping	0.057	0.128	0.130	0.208	0.079	0.097								
Information seeking	0.094	0.139	0.170	0.145	0.075	0.103	0.106							
Information sharing	0.045	0.074	0.098	0.133	0.086	0.100	0.059	0.406						
Personal interaction	0.152	0.064	0.062	0.070	0.089	0.084	0.113	0.066	0.049					
Responsible behavior	0.078	0.082	0.068	0.134	0.070	0.211	0.080	0.064	0.069	0.038				
Social	0.043	0.058	0.051	0.160	0.076	0.053	0.071	0.146	0.117	0.044	0.050			
Student satisfaction	0.030	0.123	0.209	0.086	0.075	0.154	0.098	0.065	0.062	0.086	0.074	0.059		
Tolerant	0.106	0.132	0.093	0.096	0.070	0.072	0.242	0.106	0.089	0.063	0.047	0.092	0.083	

Table 5.5. HTMT Ratio

5.3.2.2. At the second stage

At the second stage student satisfaction, and student perception of the value's second order indicators (functional, epistemic, emotional, social, and conditional), and student participation behavior's second order indicators (information seeking, information sharing, responsible behavior, and personal interaction) and student citizenship behavior's second order indicators (Advocacy, helping, feedback, and tolerant) are conducted as a formative construct in the model. As Lee and

Cadogan (2013, p 246) indicated, “higher-order reflective models are not valid when the first-order constructs are not conceptually identical. In the latter case, if the researcher feels impelled to combine first-order constructs into a single “thing”, then the only logical way forward is to combine the dimensions formatively”. As for the formative construct, the same evaluation was followed. Regarding the significance of the weights of the student participation behavior and student citizenship behavior resulted significant. VIF value of the formative constructs were below the suggested 3.3 cut-off point. Analyses are shown in Table 5.6.

	weight	VIF
student satisfaction	1	1
Student perception of value		
Functional	0.495	1.024
Epistemic	-0.292	1.027
Emotional	0.590	1.012
Social	-0.211	1.013
Conditional	0.483	1.003
Student participation behavior		
Information seeking	0.871	1.140
Information sharing	0.137	1.138
Responsible behavior	0.209	1.002
Personal interaction	0.300	1.002
Student citizenship behavior		
Feedback	0.747	1.003
Advocacy	-0.155	1.007
Helping	0.553	1.035
Tolerant	0.215	1.038

Table 5.6. Assessment of the measurement Stage 2 model for the formative constructs

5.3.2.3. At the third stage

At the third stage the student satisfaction, student perception of the value's second order indicators (functional, epistemic, emotional, social, and conditional), and student co-creation behavior third order indicators (student participation behavior and student citizenship behavior) are conducted as a formative construct in the model.

Reliability analysis was done to formative indicators on each construct to test the internal consistency. Furthermore, composite reliability was checked as well to evaluate the internal

reliability of each scale. Analyses are shown in Tables 5.7.

As for the third order formative construct the same evaluation was followed. Regarding the significance of the weights of the student participation behavior and student citizenship behavior resulted significant. VIF value of the formative constructs were below the suggested 3.3 cut-off point.

	weight	VIF
student satisfaction	1	1
Student perception of value		
Functional	0.494	1.024
Epistemic	-0.291	1.027
Emotional	0.591	1.012
Social	-0.206	1.013
Conditional	0.484	1.003
Student co-creation behavior		
Student participation behavior	0.598	1.002
Student citizenship behavior	0.773	1.002

Table 5.7. Assessment of the measurement Stage 3 model for the formative and reflective constructs

5.3.3. The Structural Equation Model Analysis

Structural Equation Modeling (SEM) is a multivariate statistical analysis technique that is utilized to analyze structural relationships. This strategy is a blend of factor analysis and multiple regression analysis, and it is utilized to analyze the structural relationship between measured variables and latent constructs. This method was utilized for this study since it estimates the multiple and interrelated dependence in a single analysis (Byrne, 2016) being a comprehensive means for evaluating and modifying conceptual research models. In addition, it offers great potential for furthering theory development (Anderson & Gerbing, 1988).

Thus, we employed SEM to test the proposed hypotheses that form the research model of study, using PLS-SEM. To test the model fit, the same cut-off values recommended by Schreiber *et al.* (2006) have been followed. The regression weights derived from implementing SEM have been utilized to test the hypotheses and determine the significant relationships. The bootstrap (1000 samples) procedures allow to generate the standard errors and confidence intervals and to evaluate the sampling distributions of estimators of direct and indirect effects (Table 5.8) (Bollen & Stine, 1990).

So, a structural equation model was established with the “Customer value Co-creation Behavior”, “Customer Perception of value” and “Customer Satisfaction”.

	Hypotheses	T Statistics (O/STDEV)	P Values	Coefficients	Hypothesis result
H1	student co-creation -> student satisfaction	0.768	0.443	0.055	NS
H1a	student participation behavior -> student satisfaction	0.206	0.836	0.097	NS
H1a(1)	Information seeking -> student satisfaction	0.264	0.791	0.057	NS
H1a(2)	Information sharing -> student satisfaction	0.084	0.933	0.055	NS
H1a(3)	Responsible behavior -> student satisfaction	0.703	0.482	0.067	NS
H1a(4)	Personal interaction -> student satisfaction	1.428	0.154	0.056	NS
H1b	Student citizenship behavior -> student satisfaction	0.588	0.557	0.063	NS
H1b(1)	Feedback -> student satisfaction	0.675	0.500	0.054	NS
H1b(2)	Advocacy -> student satisfaction	0.220	0.826	0.059	NS
H1b(3)	Helping -> student satisfaction	0.509	0.611	0.062	NS
H1b(4)	Tolerant -> student satisfaction	0.069	0.945	0.060	NS
H2	student co-creation -> Student perception of value	5.946	0.000	0.054	Significant
H2a	student participation behavior -> Student perception of value	1.167	0.244	0.165	NS
H2a(1a)	Information seeking -> Functional	0.597	0.551	0.060	NS
H2a(1b)	Information seeking -> Epistemic	1.484	0.138	0.059	NS
H2a(1c)	Information seeking -> Emotional	2.053	0.040	0.056	NS
H2a(1d)	Information seeking -> Social	2.093	0.037	0.058	NS
H2a(1e)	Information seeking -> Conditional	1.408	0.159	0.062	NS
H2a(2a)	Information sharing -> Functional	1.107	0.269	0.052	NS
H2a(2b)	Information sharing -> Epistemic	0.649	0.517	0.069	NS
H2a(2c)	Information sharing -> Emotional	0.658	0.511	0.055	NS
H2a(2d)	Information sharing -> Social	2.061	0.040	0.051	Significant
H2a(2e)	Information sharing -> Conditional	0.093	0.926	0.061	NS
H2a(3a)	Responsible behavior -> Functional	2.536	0.011	0.058	Significant
H2a(3b)	Responsible behavior -> Epistemic	1.869	0.062	0.057	NS
H2a(3c)	Responsible behavior -> Emotional	0.766	0.444	0.060	NS
H2a(3d)	Responsible behavior -> Social	0.211	0.833	0.059	NS
H2a(3e)	Responsible behavior -> Conditional	1.254	0.210	0.047	NS
H2a(4a)	Personal interaction -> Functional	0.460	0.646	0.059	NS
H2a(4b)	Personal interaction -> Epistemic	0.162	0.872	0.070	NS
H2a(4c)	Personal interaction -> Emotional	0.656	0.512	0.061	NS
H2a(4d)	Personal interaction -> Social	0.310	0.756	0.061	NS
H2a(4e)	Personal interaction -> Conditional	0.424	0.672	0.061	NS
H2b	Student citizenship behavior -> Student perception of value	4.224	0.000	0.059	Significant
H2b(1a)	Feedback -> Functional	2.327	0.020	0.054	Significant
H2b(1b)	Feedback -> Epistemic	0.404	0.687	0.061	NS

H2b(1c)	Feedback -> Emotional	1.846	0.065	0.058	NS
H2b(1d)	Feedback -> Social	0.006	0.995	0.062	NS
H2b(1e)	Feedback -> Conditional	2.415	0.016	0.058	Significant
H2b(2a)	Advocacy -> Functional	0.902	0.367	0.060	NS
H2b(2b)	Advocacy -> Epistemic	1.019	0.309	0.065	NS
H2b(2c)	Advocacy -> Emotional	0.039	0.969	0.066	NS
H2b(2d)	Advocacy -> Social	0.204	0.839	0.065	NS
H2b(2e)	Advocacy -> Conditional	1.177	0.239	0.057	NS
H2b(3a)	Helping -> Functional	0.569	0.570	0.060	NS
H2b(3b)	Helping -> Epistemic	2.144	0.032	0.065	Significant
H2b(3c)	Helping -> Emotional	1.359	0.174	0.055	NS
H2b(3d)	Helping -> Social	0.190	0.849	0.069	NS
H2b(3e)	Helping -> Conditional	1.408	0.159	0.060	NS
H2b(4a)	Tolerant -> Functional	0.696	0.486	0.058	NS
H2b(4b)	Tolerant -> Epistemic	0.178	0.859	0.062	NS
H2b(4c)	Tolerant -> Emotional	0.795	0.427	0.064	NS
H2b(4d)	Tolerant -> Social	1.049	0.295	0.065	NS
H2b(4e)	Tolerant -> Conditional	1.786	0.074	0.060	NS
H3	Student perception of value -> student satisfaction	3.470	0.001	0.060	Significant
H3a	Functional -> student satisfaction	1.535	0.125	0.054	NS
H3b	Epistemic -> student satisfaction	0.712	0.476	0.062	NS
H3c	Emotional -> student satisfaction	2.858	0.004	0.054	Significant
H3d	Social -> student satisfaction	0.255	0.799	0.061	NS
H3e	Conditional -> student satisfaction	1.539	0.124	0.063	NS

NS: Not significant

Table 5.8. Structural Equation Model for Conceptual Model

Source: Own elaboration

5.3.3.1. Interpreting the Results

According to the model customer value co-creation behavior impacts customer satisfaction and customer value co-creation behavior does not impact customer perception of value. Finally, customer perception of value impacts customer satisfaction.

Hence the conceptual model is confirmed with the results of hypotheses (Table 5.9) and with this list of the significant relations:

The path between customer value co-creation behavior and customer satisfaction was not significant at $p < .001$.

The path between customer value co-creation behavior and customer perception of value was significant at $p < .001$.

The path between customer perception of value and customer satisfaction was significant at $\rho < .001$.

Hypothesis	Path	P-value	Result	Interpretation
H1. Student Co-creation behavior during GBL has an impact on student satisfaction with GBL in HE.	When co-creation behavior goes up by 1, customer satisfaction goes up by 0.055.	0.443	Rejected	No evidence against H_0
H2. Student co-creation behavior during GBL has an impact on student perception of value of GBL in HE.	When co-creation behavior goes up by 1, customer perception of value goes up by 0.054.	0.000	Supported	Very strong evidence against H_0
H3. Student perception of value of GBL has an impact on student satisfaction with GBL in HE.	When customer perception of value goes up by 1, customer satisfaction goes up by 0.060.	0.001	Supported	Very strong evidence against H_0

Table 5.9. Results of the Hypothesis
Source: Own elaboration

The results do not support H1, hence there are no significant relationships between student co-creation behavior and student satisfaction ($\beta=0.055$, $t=0.768$). Furthermore, H1 sub-hypotheses are not supported as the path between customer co-creation behavior components and customer satisfaction were not significant at $\rho < .001$ (see table 5.8).

Secondly, the results support H2 which refers to the relationship between student co-creation behavior and student perception of value ($\beta=0.054$, $t=5.946$). According to Table 5-9, student co-creation behavior has a positive impact on student perception of value. Regarding the sub-hypotheses, the path between student participation behavior and student perception of value was not significant ($\beta=0.165$, $t=1.167$). While, the results do support H2a(2d) "Information sharing -> Social" ($\beta=0.051$, $t=2.061$), and H2a(3a) "Responsible behavior -> Functional" there is significant relationship between responsible behavior and student functional value perception ($\beta=0.058$, $t=2.536$).

The path between student citizenship behavior and student perception of value was significant thus supporting H2b ($\beta=0.059$, $t=4.224$). Moreover, the result support H2b(1a) (there is significant relationship between student feedback and student functional value perception) ($\beta=0.054$,

t=2.327), and H2b(1e) (there is significant relationship between student feedback and student conditional value perception) ($\beta=0.058$, $t=2.415$). The result additionally, supports H2b(3b) (there is significant relationship between student helping and student epistemic value perception) ($\beta=0.065$, $t=2.144$).

Finally, H3, which refers to the relationship between student perception of value and student satisfaction, proved to be significant ($\beta=0.060$, $t=3.470$). However, not all dimensions of perceived value have a significant impact. The results do support only H3c which refers to the relationship between student emotional value perception of GBL in HE and student satisfaction ($\beta=0.054$, $t=2.858$).

5.4. Conclusion

In this chapter, a conceptual model was developed followed by a structural equation model of the relationships between co-creation behavior, customer perception of value and customer satisfaction. The results identified significant relationships between “student co-creation behavior and student perception of value” and “student perception of value and student satisfaction” but no evidence was identified to support the relationship between “student co-creation behavior and student satisfaction”.

Chapter 6 Discussion

6.1. Introduction

The current thesis critically discusses the student satisfaction antecedents, perception of value and co-creation behavior in HE. Additionally, it clarifies how is the relationship between student co-creation behavior, student perception of value and student satisfaction in GBL in HE.

In this section, we revisit the research question of the study and present and discuss the main findings from the interviews and the survey.

6.2. Research questions

RQ1: What is the relationship between student co-creation behavior and student satisfaction in GBL in HE?

Several studies have emphasized that games and GBL are tools for student co-creation in HE. Pöyry-Lassila *et al.* (2017) further stress that the potential of game design and development projects supports extensive engagement and knowledge co-creation. A higher level of co-creation enhances satisfaction with it, which has a mediating effect on engagement and future co-creation intentions (Frasquet-Deltoro, Alarcón-del-Amo, & Lorenzo-Romero, 2019). This study explores what constitutes students' satisfaction with GBL and examines the influence of students' co-creation behavior on overall satisfaction with GBL experience.

Our results are contrary to the results of previous studies. Student co-creation behavior during GBL has no impact on student satisfaction with GBL. The empirical study results show that students mostly agree with the statements as they mention "My feelings towards the GBL are very positive" and "In general, I am satisfied with GBL". Customers' satisfaction with their participation in the creation of the service offering is defined as satisfaction with the co-creation performance. It might be claimed that clients who are satisfied with their own co-creation performance are willing to pay more for the service. However, it does not guarantee customer satisfaction with the service (Grissemann & Stokburger-Sauer, 2012).

The most co-creation behaviors students were willing to act during GBL identified from the results of regression analysis and show in order of importance, based on standardized beta coefficients are

described as follows:

“Information seeking” is identified as asking others for information on what game the institution offers, paying attention to how others behave to use the game and seeking information about the location of the game.

“Feedback” incorporates informing the lecturer when they experience a problem, sharing their idea on how to improve the games, and commenting about the satisfactory services they received.

“Helping” refers to the degree to which a student helps others in the GBL procedure, such as helping fellow students who have difficulty in game.

Furthermore, the results show that student are/were not willing to advocacy the GBL.

RQ2: What are the factors that contribute to student satisfaction in GBL in HE?

Several studies have focused on student satisfaction in HE. Satisfaction with GBL can be defined as students' positive feelings (Deng, Turner, Gehling, & Prince, 2010; Gupta *et al.*, 2010) towards GBL. The empirical study results show that students mostly agree with the scales as “My feelings towards the GBL are very positive” and “In general, I am satisfied with GBL”.

This research tends to focus on customer satisfaction caused by enhanced customer value in terms of co-creation behavior in GBL environment. According to the literature, when consumers' self-efficiency improves, the degree of engagement in the service activity is no longer perceived as a cost, but rather as a contribution to customer value (van Beuningen, de Ruyter, & Wetzels, 2011). Our results go in the same line as previous studies (Santini *et al.*, 2017; Moosmayer & Siems, 2012; Nell & Cant, 2014; Martirosyan, 2015; Usman, 2010; Duque, 2013; Ledden & Kalafatis, 2010; Chen, 2011; Incesu & Asikgil, 2012; Durvasula *et al.*, 2011; Teo & Soutar, 2012) and indicate the positive impact of student perception of value on student satisfaction.

The five factors identified from the results of regression analysis and shown in order of importance the factors that explain GBL value, based on standardized beta coefficients, can be described as follows: “Emotional value”, was the most popular GBL's value recognized by students as indicated by Deng, Turner, Gehling, and Prince (2010), and Gupta *et al.* (2010) as well. This value is

concerned with the affective states of students in the form of positive feelings such as being glad, self-achievement and self-confidence they have toward GBL method. Followed by “functional value” (The GBL in HE support student career development), and “conditional value” (teaching materials, number of students and so on).

However, from students point of view, GBL does not improve their knowledge (epistemic value). In fact, students are not able to understand the importance of certain subjects of learning and/or the value of certain activities (especially in the short term) (Bay & Daniel, 2001). In addition, it can take students years to recognize and calculate the real value of the education they receive (Carvalho & de Oliveira Mota, 2010). Furthermore, we assume that the negative social value results as the sample was gathered during COVID-19 pandemic, the situation might have impacted the student perception of value of GBL in HL.

6.3. Hypotheses

The structural model evaluation supported the discriminant validity of the constructs and confirmed that the measures of the constructs are truly distinct. The estimated correlations of discriminant validity were statistically significant (Kline, 2005). Student satisfaction is considered to be the most important factor for sustainable competitive advantage in HE (Santini *et al.*, 2017); therefore, the learning method is vital in the co-creation process, the relationship also supported by our quantitative study. In consistency with prior studies (Kuhmonen *et al.*, 2018; Pöyry-Lassila *et al.*, 2017; Santini *et al.*, 2017) we found the favorable perceptions of students towards co-creating value during the GBL experience.

H1. Student co-creation behavior during GBL has an impact on student satisfaction with GBL in HE.

The relationship between clients' contribution to the value co-creation process and organizational performance has been documented. Much exploration has assessed customer satisfaction and customer loyalty as the result that enterprises achieved when integrating clients' commitments (Chen & Wang, 2016; Vargo, 2008;. Cossio-Silva *et al.*, 2016; Grisseemann & Stokburger-Sauer, 2012; Foroudi *et al.*, 2019). However, our findings do not support any relationship between these elements. As our study is the first scholarly work to examine the student co-creation behavior in

GBL environment, our result may be due to the fact that students co-creation is different in their GBL in HE experience. Interestingly enough, lecturers claim that the GBL method has an effect on students' attitude towards the value creation behavior. From the two interviewees' points of view, student, as an actor, having the main role in their learning process in GBL.

Our result shows that student co-creation behavior during GBL has no impact on student satisfaction. This study particularly highlights the importance of gamification of learning in helping students interact with the curriculum and also providing them with opportunities for educational performance. Results show that students are willing to seek the information regarding GBL, provide feedback to the service provider during the GBL experience and have responsible behavior during GBL. However, according to the result from the research sample, the relationship between students co-creation behavior in GBL and their satisfaction with GBL is not significant.

In the current study, we measure student satisfaction with GBL as students' positive feelings (Deng, Turner, Gehling, & Prince, 2010; Gupta *et al.*, 2010) towards GBL. We used the items such as "My feelings towards the GBL are very positive", "The experience that I have had with game-based learning has been satisfactory" and "In general, I am satisfied with GBL". Zhu, Sun, & Chang (2016) indicate that the antecedents of client citizenship behavior (CCB) are informational support, social support and satisfaction with the firm. Customers' satisfaction with their participation in the creation of the service offering is defined as satisfaction with the co-creation performance. Grisseman and Stokburger-Sauer (2012), examine customer satisfaction with the co-creation performance and Customer satisfaction with the service company. It might be argued that customers who are happy with their own performance in co-creation are willing to pay more for the service (GBL). However, it does not ensure that the service will be appreciated by the clientele.

H2. Student co-creation behavior during GBL has an impact on student perception of value of GBL in HE

A considerable number of studies has analyzed the impact of customers' value co-creation on perceived value, and then to organizational performances (Chan, Yim and Lam, 2010; Chen & Wang, 2016; Dong *et al.*, 2008; Tran & Vu, 2021). Based on the literature, we proposed the second hypothesis: Student co-creation behavior during GBL has an impact on student perception of value

of GBL in HE.

In the hypothesis testing, the results support the relationship between student co-creation behavior and student perception of value. The findings show that the more students engage in the value co-creation process, the more favorably they perceive GBL's value. We examined the relationship between student participation behavior and student perception of value of GBL in HE. The hypotheses testing supports the impact of student responsible behavior on student functional value and information sharing on student social value of GBL in HE. Students have responsibilities and duties, such as completing coursework, maintaining a minimum level of class attendance, listening attentively when a lecturer explains lessons. "So they get a lot of data from this system after they have handed in these tools and they can just check off their performance and they can also compare their performance from a triple bottom line perspective." (interviewee A, IBA). Functional value refers to students' perceptions that the GBL in HE, supports their career development. Active learning methods like GBL encourage creativity while also assisting students in the development of skills that will increasingly influence their future employability and personal growth. Interviewees assume that students understand the functional value of GBL in their next internship position in the market. Student gave the lecturer proper information and clearly explained what they wanted the lecturer to provide them regarding using the game and perceive that it would make their studies more interesting and has positive effect on the value of their education. The result supports the relationship between students' information sharing behavior and their perception of social value of GBL in HE.

Our study identified a positive relationship between student citizenship behavior and student perception of value, mainly, student feedback behavior positively impacts student perception of GBL's functional and conditional value. How much a student gives feedback in the GBL procedure, for instance, "When I experience a problem using the games/simulations/ applications, I let the lecturer know", telling a lecturer when they have an idea from GBL "When I received good service from the institution staff regarding the utilization of the games/simulations/ applications, I comment about it." has impact on student perception of GBL's functional (employability) and conditional value which includes the support materials, facilities, convenience of the location and so on. This value is expected from the lecturer as well: "So if they say we need some guidance here because some of them tend to be lazy, and if they're not able to solve that, we come back and say, now we have a meeting here and

I try to help you out here, how you can engage with yourself to be even smarter, to really understand what kind of value you can bring and how you can benefit from it.” (interviewee A, IBA). The GBL conditional value is also expected to be perceived by students. Interviewees state that if students need guidance or are unable to solve problems and complete their assignments, the instructor will assist them and encourage them on how to participate and succeed.

Additionally, students were willing to assist each other when they face difficulty or to use the game correctly and perceive that this behavior in GBL would influence the value of their education and learn new things from GBL experience.

The results from the hypotheses testing do not support any relationship between student participation behaviors except student responsible behavior and information sharing and student perception of value. Moreover, the relationship between student advocacy behavior and tolerance with student perception of value are not supported. As most of the responses were from the simulation and digital games which are provided online for the students during the covid-19 pandemic, we would conclude that there could be an impact on the student perception of value and co-creation behavior.

H3. Student perception of value of GBL has an impact on student satisfaction with GBL in HE.

Previous studies have examined the relationship between student perceived value and student satisfaction. They indicated that student perceived value has a positive effect toward satisfaction and trust (Halimatussakdiah *et al.*, 2018; Hume & Mort, 2010; Moliner *et al.*, 2007; Shukla, 2010 Elliott, 2002; O'Bannon *et al.*, 2011; Defranceschi & Ronchetti, 2011; Traphagan *et al.*, 2010; Lancaster *et al.*, 2011; Johnston *et al.*, 2013; Dickson *et al.*, 2012). Despite the fact that numerous examinations about the relationship between these variables there has been scarce attention in the HE context.

In this study, five elements of perception of the value of experiencing GBL are measured as the following dimensions: functional, social, emotional, epistemic and conditional elements. The results confirmed that the favorable perception students hold towards the GBL in their HE experience, have

a positive impact on their satisfaction. The relationship between student perception of value and student satisfaction proved to be significant. In order of importance the factor that most explains GBL value, based on the standardized beta coefficients is emotional value. The results show that the perceived value mainly comes from the emotional value in the form of the positive feelings such as being glad, self-achievement and self-confidence they have toward GBL method. Interviewees emphasized the emotional value of GBL to students. They show that GBL provides a safe and comfortable environment for students to have the opportunity to use the concepts taught in the classroom in simulation and to be able to try things safely and stress-free. "They have an opportunity to apply some of the concepts that we're talking about in the classroom, they can apply those in the simulation and they can try things without the risk of people losing jobs and those kind of things. You know." (interviewee B, IBA).

Schöbel *et al.* (2020) argue that if a game in learning can show how well students have performed, it can have positive impacts on their learning process satisfaction. This in turn will make learners want to continue with their learning process. Also, another lecturer mentioned that "students have to bring that knowledge and share that knowledge and the inspiration to make sure that they are actually able to find the strategy to follow. So they're actually competing against all the other groups".

Indeed, support for the student perceptions of functional value, i.e. the future value of GBL in terms of the guarantee of a good salary and career advancements, was found in the quantitative analysis results. As one of the interviewee mentioned: "when they go for next internship, they will be seen much more professional. They see themselves much more as consultants and they bring the discussion to a higher level so that we can see their numbers and degrees later on." (interviewee A, IBA).

Besides, according to LeBlanc and Nguyen (1999), a good salary, and promotions; the development of knowledge and skills that help to achieve career goals are the students' functional perception of value (Bruce & Edgington, 2008; LeBlanc & Nguyen, 1999; Ng & Forbes, 2009; Stafford, 1994; Sampaio *et al.*, 2012). This study provides a new outlook in conceptualizing perception of value and its relation to the GBL. The analytical findings are supported by our qualitative data. Results

show that employability in the labor market (Marzo-Navarro *et al.*, 2005) is one of the most GBL method value. The findings are supported by the qualitative research as illustrated by the following excerpt from the lecturers' answers: "students would know what is the real business.... students can find the knowledge in the game and connect to the real-life... They have unlimited options and that makes it a much more complex complexity level is much higher than real life... They see themselves much more as consultants and they bring the discussion to a higher level so that we can see their numbers and degrees later on ... I think it would be easy for them to be employees later on in a company if they have this more dynamic approach" (interviewee A, IBA).

The results of the study also show that functional value, in the form of the benefits associated with the GBL method, has a direct bearing on perceptions of service value. In this situation, HEIs' management should continuously inform students of the needs of industry, the opportunities that exist with regard to employment, and the possibilities of career advancements. The building of a strong network with business and by encouraging students to participate in various games and dynamic learning methods prove beneficial to both students and the lecturer and even HEIs. "students are actually engaged with companies".

Chapter 7 Conclusion and implications

7.1. Conclusion

The linkages between student co-creation activity, student satisfaction, and student perceptions of GBL value in HE are the subject of this study. This study examines behavioral and affective consequences as well as cognitive outcomes, which are the most obvious and prevalent issues among other experts. Furthermore, most earlier studies have focused on the effects of games on the learning process of specific disciplines, whereas this study broadens the scope of research in HE. Gamification and GBL are becoming increasingly popular in HE. Gamification and GBL in HE are becoming increasingly popular. However, they very rarely examine student's perception of value of the GBL, student co-creation behavior and satisfaction.

This thesis analyzes and critically discusses the relationship between student satisfaction, student perception of value and co-creation behavior in GBL in HE through the following research questions: RQ1: What is the relationship between the student co-creation behavior and student satisfaction in GBL in HE?; RQ2: What are the factors that contribute to student satisfaction in GBL?. In order to achieve the objectives of this study, we conducted three systematic literature reviews and two empirical studies, one qualitative and one quantitative.

The current thesis started with a previous exploratory study, based on interviews, and thus includes both exploratory studies and confirmatory studies to develop a set of hypotheses derived from prior studies about the relationship between student co-creation behavior and perception of value in the GBL environment in HE and student satisfaction.

To explore student's perception of value of GBL from the lecturers' point of view, we started by conducting interviews with lecturers of a business academy in Denmark who are employing GBL in their teaching process at IBA (International Business Academy). And, the quantitative research was based on a survey. The survey was used to collect data to examine the students' perception of value of GBL in HE, their co-creation behavior during GBL and their satisfaction with GBL. The study's population were the students of two HEIs in Denmark, International Business Academy (IBA) (Kolding), University of Southern Denmark (SDU), and the University of Minho in Portugal. These HEIs offer a range of different GBL methods in their programs.

The data was analyzed utilizing the Statistical Package for Social Sciences (SPSS 27.0) and Smart PLS. Descriptive measurements were employed to establish a statistical profile of the respondents. For testing the hypotheses, we have used Structural Equation Modelling (SEM) based on PLS. To analyze the current thesis data, we employ the disjoint three-stage approach.

The main conclusions of the sections are presented in the following paragraphs.

7.1.1. Student satisfaction with GBL in HE

As indicated in literature, students' university experience incorporates two dimensions of core and supplementary experience. Our study (section 1), identified different antecedents of student satisfaction in HE such as the quality of programs, HEIs' marketing orientation, perceived value in educational services, resources provided to the students, interaction with other students and so on.

As the current thesis focuses on student satisfaction with GBL in HE, we discuss the antecedents of student satisfaction with GBL in HE. This study introduces GBL as an innovative learning method. The HE-games characteristics, categories and measurements are critically discussed and presented in section 2. Furthermore, the effectiveness of GBL is offered in detail.

7.1.2. Student perception of value of HE

Value in education is vital for HEIs' strategic planning and market orientation. Hence, comprehending, managing, and impacting student perception of value is key for both students and HEIs. In section 3, we focus on the student perception of value in HE. Two databases were selected to search indexed articles. Starting from 136 articles using keywords search, 88 key journal articles were systematically reviewed using both qualitative and quantitative methods for investigation. Our review synthesizes research under three main topics: (1) Dimensions of student perception of value; (2) Perceived value by students associated with different learning approaches and strategies; (3) Factors impacting upon students' value judgments; (4) Student perception of value's outcomes.

The findings indicate that value dimensions in HE are functional, social, epistemic, emotional and conditional. Although there are some factors which impact students' value judgments such as university image, quality of services, student demography and culture, valence of students'

experience, trust, student personal characteristics and personal value, and risk. Moreover, our analysis uncovered a number of student perception of value consequences. Student perception of value has an impact on their satisfaction and loyalty, intention to offer positive or negative word of mouth recommendations. In this systematic literature review we identified that learning approaches impact student perception of value in HE.

7.1.3. Student co-creation in HE

Despite this increasing active role of students in their education co-creation, there is scarce evidence of the factors that foster students' co-creation of value, as well as the benefits and barriers for HEIs and for students.

Drawing on current literature on student co-creation, we present two systematic reviews of the literature on co-creation strategies in HE (Section 4) and student co-creation roles and behaviors in HE (Section 4) in order to map extant research on this topic and offer a consolidated view of how co-creation may contribute to creating mutual value for institutions and students. Moreover, our study offers a consolidated view of the co-creation process and approaches that can be employed by HEIs to motivate students to co-create their HE experience. Comprising 128 empirical and theoretical articles, was examined.

Our review in section 4, synthesizes research under three themes; (1) co-creation strategies that can be used by HEI; (2) Co-creation barriers and benefits for HEIs; and (3) Co-creation barriers and benefits for students. We identify an exhaustive inventory of the strategies, barriers and benefits studied in extant literature. Although there are some barriers to co-creation, the analysis identified motivational and educational benefits for students and pedagogical and competitive benefits for HEIs. Moreover, our analysis uncovered a number of co-creation strategies that can be used by HEIs, namely Choice providing, Crowdsourcing, Games, Student-university identification, Experience sharing/interaction through university website and online platforms, Work-integrated learning, and Educational program design. Hence, there is a variety of ways that HEIs can use in fostering co-creation and allowing students to engage as active actors in their education process.

Our analysis in section 5, has identified that the co-creation process in HE includes dialogue, access,

risk and transparency. The main approaches used by HEIs to motivate students to co-create their HE experience are student involvement, cognitive engagement, university affiliation and emotional engagement. Our review also shows that student co-creation behaviors are mainly participation and citizenship behavior, and their co-creation roles include those of co-producers, participants, change agents and partners. Furthermore, student co-creation roles include: as a co-creator of teaching approaches, a co-creator of course design, and a producer of knowledge.

7.1.4. The relationship between student co-creation behavior and student perception of value of GBL and student satisfaction with GBL

Our qualitative data analysis results indicate that from the two interviewees' points of view, student, as an actor, have the main role in their learning process. The specific value of the simulation expected by these interviewees (lecturers at business school in Denmark) as perceived by student are related to the emotional, social, condition, and functional value.

From the lecturers' viewpoints, students bring knowledge and share that knowledge and do a collaboration during GBL. They expected that the epistemic value of the simulation they use in their teaching approach is perceived by students. Since, after receiving these tools, they receive a lot of data from this system and can check their performance, and they can also compare their performance from a triple perspective. Students will understand what real business is. Students can find knowledge in play and connect to real life

The GBL conditional value is also expected to be perceived by students. Interviewees state that if students need guidance or are unable to solve problems and complete their assignments, the instructor will assist them and encourage them on how to participate and succeed.

Interviewees emphasized the emotional value of GBL to students. They show that GBL provides a safe and comfortable environment for students to have the opportunity to use the concepts taught in the classroom in simulation and to be able to try things safely and stress-free.

The functional value of GBL is mentioned as a vital value perceived by students. Interviewees assume that students understand the functional value of GBL in their next internship position in the market. Based on the feedback instructors received from their business partners, students see themselves as

advisors in their internship situation and take the discussion to a higher level. The lecturers believe that the dynamic training approaches increase their employability in the market.

Our findings from the quantitative data analysis do not support any relationship between student co-creation behavior and student satisfaction with GBL. As our study is the first scholarly work to examine the student co-creation behavior in GBL environment, our result may be due to the fact that student's co-creation is different in their GBL in HE experience. Interestingly enough, lecturers claim that the GBL method has an effect on students' attitude towards the value creation behavior. Our result shows that student co-creation behavior during GBL has no impact on student satisfaction. Results show that students are willing to seek for the information regarding GBL, provide feedback for the service provider during the GBL experience, helping each other and have responsible behavior during GBL.

In testing the hypothesis, the results support the relationship between student co-creation behavior and student perception of value. The findings show that the more students participate in the value creation process, the better they understand GBL value. The results support the effect of student's responsible behavior on GBL student's functional value in HE. Active learning methods such as GBL encourages creativity while helping students develop skills that increasingly influence their future employability and personal growth. Thus, student information sharing behavior impact on student's perception of GBL's social value.

Our study identified a positive relationship between student citizenship behavior and student perception of value. In general, student feedback behavior positively affects student perception of GBL functional and conditional value. The amount of student feedback in the GBL method affects the student's understanding of the GBL functional (employability) and conditional value, which includes support materials, facilities, location comfort, and so on. Hence, student helping behavior impact student GBL's epistemic value and they perceive that helping each other would impact the value of their education and learn more.

In this study, five elements of perception of the value of GBL experience were measured in the following dimensions: functional, social, emotional, epistemic and conditional value. The results confirmed that students' optimal perception of GBL in HE experience has a positive effect on their

satisfaction with GBL. The relationship between student perception of value and student satisfaction was significant. In order of importance, the factor that most explains GBL value based on standardized beta coefficients is emotional value. The results show that perceived value derives mainly from emotional value in the form of positive emotions such as happiness, success and self-confidence compared to the GBL method.

We conclude that the status of the Covid-19 epidemic may have affected the results of our study.

7.2. Implications

7.2.1. Managerial Implications for Practice

Some significant implications emerge from the research's findings. Our study in section 3 suggests that trust in faculty has a positive effect on perceived value. This conveys that different employees will have a different impact on value perception, the role performed by the employees affects value perceptions. Perceived value is a vital element for setting up a student loyalty platform. The managerial implication is that there is a need to minimize perceptions of sacrifice before students enroll on the program. The importance of perceived service value as a major form of the customers' assessment of services has been acknowledged in the literature. As such, the study identified the factors that have an impact on perceived service value and that have implications for formulating strategies that add value for students during their learning experience.

Universities seek to be viewed as customer-oriented, as this can positively impact important relational outcomes such as satisfaction, retention, and positive word of mouth. The present study emphasizes the importance of HEIs comprehending the appropriate co-creation approaches and processes. Understanding students' intention to co-create can help universities maintain or gain competitive advantage through customer co-creation, student suggested/influenced improvements and innovations (Robinson & Celuch, 2016). The result from the current investigation emphatically suggests that co-creation of value is important in shaping students' perception of value of the university experience. HEIs which pay more attention to this are more likely to enrich the students' experience.

HE managers, educational developers and instructors should be aware that when students engage in

participation and citizenship behaviors, it impacts their evaluations of service quality, their feelings of satisfaction, perceptions of goal attainment, and behavioural intentions. As our systematic literature in section 4 shows, there are several approaches to the process of co-creation that institutions can pursue. HEIs have tremendous potential to devise strategies for leveraging students' participation and their inputs as an unlimited resource (Torkzadeh *et al.*, 2020). HEIs need to find ways to devise the most adequate approaches depending on the profile of the institution, the resources available, the area of study, etc.

Co-creation in HE places students at the centre of the process, rather than policymakers or professionals, and has significant implications for process management, such as how HE innovations are developed and how risk is managed in the innovation process. Moreover, it implies that student co-production is improving the quality and impact of existing HE services and bringing students' experience together with participative planning to generate new approaches to HE services (Radnor *et al.*, 2014). Findings from recent research suggest that HEIs can benefit from student co-creation. Thus, it could be argued that some types of co-creation behavior like student citizenship behavior need to be learned and practiced by students before graduation to prepare them to provide critical contributions to their future jobs. This might require university administrators to become better familiar with and nurture the student citizenship behavior and participation behavior concept in students.

While some students may get involved in curriculum co-designing activities for personal reasons (such as fun, enjoyment, interest, and experience), others may participate for external reasons (such as gaining peer recognition, promotion, social identification, and rewards). HEIs' must understand such dynamics in order to devise an effective strategy. Furthermore, HEI should develop or implement various co-creation strategies that enhance student's perceived competence. The more confident students are in their talents, the more likely they are to actively engage in their co-creator role.

We Identified that the HEIs were engaging and involving students in their educational services process to allow them to co-create. Moreover, the main student's co-creation roles in HE are presented. Our findings provide educators and scientists with the required information supported by different investigations to consider the integration of educational games with their current

learning method.

The encouraging results, gained inspire lecturers to implement GBL activities in their courses. These findings enable us to provide HEIs managers with a set of recommendations regarding leveraging the GBL to enhance the HE experience.

7.2.2. Implications for theory

Past research has made well-recognized contributions towards the study of the gamification of education and GBL environment. However, few empirical studies have investigated how the GBL method affects co-creation, and satisfaction. Section 1 and 2 contribute to present preliminary results and the underlying idea of the activity.

Theoretically, this research contributes to existing knowledge by providing an integrated and conceptualized GBL, perception of value, customer value co-creation behavior and satisfaction in the context of a HE. While existing literature has not yet inspected the critical role of GBL in influencing student's co-creation behavior and student perception of value, this study investigates how GBL can lead to students' participation and citizenship behavior so as to create values for the university and themselves. It is worth noting that we also provide a broad discussion of the new study path between students' desire to co-create and their understanding of value in GBL in HE. This path had not been studied before in the literature and a better understanding of it increased the theoretical and practical contribution of this dissertation.

In addition, this study specifically adds to research using GBL as an innovative learning method during COVID-19 epidemics and beyond. The categories, features, and measurements of the game in HE training and the effectiveness of the training system are presented in Section 2. The findings of these sections and the study show how GBL affects student satisfaction and co-creation behavior as well as their understanding student's perception of the value of GBL in HE.

The findings provide insights for those who might be designing a student satisfaction survey for use in the other regions. Surveys developed in the studied universities do not necessarily reflect the major attributes that might impact students' satisfaction in other research settings. Students in the current

study were primarily concerned with GBL techniques. GBL, which is not addressed in most student satisfaction in HE studies. Moreover, our analysis uncovered a number of students' perception of value consequences.

At the level of student co-creation, previous research has yielded different findings on the importance and impact of this factor on the education system. This thesis lists and classifies the various strategies and platforms for students to co-create their HE experience. In addition, the analysis in the second Systematic Literature Review (Section 4) identified motivational and educational benefits for students and educational and competitive benefits for HEIs. The presented results are considered to be the most comprehensive results, since in addition to the facilities and recreational activities that have already appeared in the literature, it encompasses co-creation antecedents identified. Moreover, Section 4 maps co-creation strategies in HE for the first time.

This thesis critically analyzes and critically discusses the state of the art of student co-creation in HE and the approaches that higher education institutions use to engage students. This study helps to clarify the model of student co-creation in HE and to identify research gaps and further research opportunities by providing a map of existing research. The third review of the systematic literature (Section 5) sheds light on the process and approaches of co-creation in HE used by HEIs. In addition, the findings provide a map of the co-creation patterns that students play and their co-creation behaviors.

7.3. Limitations and Future Lines of research

7.3.1. Limitations

This work is not without limitations. First, it does not include all possible academic sources, but it is focused on major databases of scientific journals. Relevant knowledge might also come from investigations that are not included in the selected list. Second, the keywords employed in systematic literature reviews could be enriched or modified to extend the coverage of potentially interesting articles. Moreover, some studies might utilize different labels of keywords to refer to student perception of value depending on the theoretical development, which constitutes the foundation of the study.

The current thesis implements methodologies that use quantitative techniques. This approach results in a number of delimitations. For instance, the adopted scales that measure the studied factors are sourced from previous scales in the related literature. No qualitative research has been done to generate new scales. This serves the methodological approach that was followed. In addition, the longitude of the survey might also make some people more willing to take and complete the survey.

Understanding student satisfaction can contribute towards understanding how to attract and impact students' perceptions of the value, therefore, improving the decisions made by HEIs planners and managers. The current thesis focuses only on five student perception of value of GBL. However, image value was not included in the analysis.

Moreover, the conducted research focuses on students' point of view; yet, it has not looked at this issue from the universities perspective. Therefore, this could be a limitation for not giving a full picture of clarifying the primary perspectives identified with the effective implementation of satisfaction from both sides i.e., customers and service providers or universities' reputation and brand image.

The empirical research has been completed in the years 2019-2021 which were impacted by the COVID-19 pandemic. This short time period may neglect numerous others facts and the pandemic situation may impact the study results. Evaluations and descriptions made will be made from the perspective of the data accessible at the time the examination is led. The points and objectives cover an extensive variety of components, with the research design requiring various investigations to be done. Almost certainly, further research ought to be done once a potential market is recognized, narrowing the scale and scope of another single area. Relating to data analysis, various levels of interpretation are incorporated. Every effort will be made to ensure that specialist bias has not gone into the examination, and it is pertinent to take note that there are no personal stakes held by the analyst in any of the areas.

7.3.2. Future Lines of research

This study revealed some gaps in the literature that need to be further addressed. Our systematic

literature reviews' descriptive analysis revealed that the number of published articles in area of student perception of value and student co-creation behavior are still limited. Based on our study, we propose some directions for further research:

- This study focus on student satisfaction with GBL and analyse the impact of student co-creation behavior on student satisfaction with GBL. The results do not confirm any relationship between student co-creation behavior and student satisfaction with GBL. Future studies would formulate student satisfaction scales measurements to measure student satisfaction with their co-creation performance.
- There would be an interesting insight to identify the impact of students' perception of value on their co-creation behavior in GBL or other dynamic learning approaches.
- Future studies could focus on the relationship between utilization of GBL in HEIs and their brand equity.
- This is an interesting insight into how the demographic effects will be on students' perceptions of value in GBL in HE. In addition, it is extremely important to study how multinational partners behave in different contexts, such as other countries, cultures and religions. There will be interesting insights into how perceptions of benefits and risks are influenced by different cultures and what borderline conditions or regulatory factors are.
- Further research efforts are needed to better understand the student's perception of value in HE using various active learning approaches such as GBL, project-based learning, problem-based learning, and so on. Understanding students' perception of value in HE by using a variety of active learning approaches, helps HEI provide innovative, high-quality learning approaches that dynamically meet students' perceived needs and value. In this regard, it encourages more calls for research. The studies can then examine the clear documentation of the initial motivations and results of each approach to adopting a participatory plan based on existing knowledge.
- A better understanding of the factors that affect students' perceptions of value is needed. In particular, another consequence of this study stems from a recent stream of research focused

on the impact of demographic effects on students' perceptions of value in HE. Further discussion on the benefits and costs perceived by different ages, genders and marital status.

- Most of the works considered are case studies or concept development articles, while research aimed at exploring a wider data set is scarce. Hence, more research efforts are needed to better understand co-creation in HE with respect to each aspect covered in the present study.
- Analysis of measurement of co-creation in HE performance and other outcomes such as student satisfaction and perceived value and employability is still in its infancy. Despite the introduction of models and processes of analysis by some researchers, the issue of measuring the effectiveness of co-creation in HEI remains and there is a need for increased research efforts. This question is of particular importance to staff and academics, as it may help strengthen HEI's co-creation performance and the commitment of HEIs to co-creation practices. Future studies could focus on the relationship between brand attitudes and outcomes, such as negative word of mouth, and on advancing employability development and understanding the potential for new power dynamics.
- HEIs have been using different strategies to involve and engage students to co-create their HE experience. More research efforts are needed to further the understanding of co-creation strategies and platforms in HE with regard to every aspect covered in the present review. Examples include collaborative learning projects, namely inter-institutional and international projects, digital platforms, new approaches such as game-based methodologies, open educational resources, etc.
- Future studies can investigate the initial motivations, process, and outcomes of co-creation in HE to adopt participatory design. In order to incorporate other antecedents, such as culture and ethical values – which would provide interesting insight into how the process is affected by the different cultures of a nation –, it would be useful to investigate the boundary conditions or moderating factors that could impact students' motivation to co-create their HE experience.
- Future studies would answer the following questions: How does cognitive dissonance and

satisfaction/dissatisfaction influence students' co-creation behaviors and roles? What is the opinion of faculty, governing bodies, employees, alumni and staff or industries regarding the co-creation process?

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9. Appendix

Appendix 1 – Assessment of Normality

Items	N		Skewness	Kurtosis	Minimum	Maximum
	Valid	Missing				
Item 1	356	0	-0.242	-1.290	3	5
Item 2	356	0	0.005	-1.247	3	5
Item 3	356	0	-0.222	-1.422	3	5
Item 4	356	0	-0.572	-1.007	3	5
Item 5	356	0	-0.640	-1.037	3	5
Item 6	356	0	-0.377	-1.316	3	5
Item 7	356	0	-0.761	-0.851	3	5
Item 8	356	0	-0.294	-1.265	3	5
Item 9	356	0	-0.308	-1.374	3	5
Item 10	356	0	-0.294	-1.373	2	5
Item 11	356	0	-0.257	-1.440	3	5
Item 12	356	0	-0.208	-1.450	3	5
Item 13	356	0	-0.995	-0.010	3	5
Item 14	356	0	-0.874	-1.244	4	5
Item 15	356	0	-1.205	-0.273	3	5
Item 16	356	0	-1.492	1.152	3	5
Item 17	356	0	-1.486	1.051	3	5
Item 18	356	0	-0.958	-0.680	3	5
Item 19	356	0	-2.459	5.218	2	5
Item 20	356	0	-1.457	0.957	3	5
Item 21	356	0	-1.711	1.950	3	5
Item 22	356	0	-1.637	1.481	3	5
Item 23	356	0	-1.876	2.784	2	5
Item 24	356	0	-1.142	0.312	3	5
Item 25	356	0	-1.838	2.528	3	5
Item 26	356	0	-1.819	2.387	3	5
Item 27	356	0	-1.762	2.253	3	5
Item 28	356	0	-0.284	-1.365	3	5
Item 29	356	0	-1.016	-0.629	3	5
Item 30	356	0	-0.300	-1.099	3	5
Item 31	356	0	-0.117	-1.778	3	5
Item 32	356	0	-0.248	-1.399	3	5
Item 33	356	0	0.209	-1.388	3	5

Item 34	356	0	-1.216	0.268	3	5
Item 35	356	0	-1.271	0.565	3	5
Item 36	356	0	-1.530	3.417	2	5
Item 37	356	0	-1.209	0.401	3	5
Item 38	356	0	-1.517	2.201	2	5
Item 39	356	0	-0.710	-0.459	3	5
Item 40	356	0	-1.559	1.701	2	5
Item 41	356	0	-0.917	-0.605	3	5
Item 42	356	0	-0.818	-0.318	3	5
Item 43	356	0	-0.744	-0.858	4	5
Item 44	356	0	-0.964	-0.151	3	5
Item 45	356	0	0.011	-0.548	3	6
Item 46	356	0	-0.041	-0.812	3	6
Item 47	356	0	-0.738	-0.642	2	5
Item 48	356	0	0.071	-1.189	3	6
Item 49	356	0	-0.411	-0.823	3	6
Item 50	356	0	-0.817	-0.067	2	6
Item 51	356	0	-0.353	-1.000	3	6
Item 52	356	0	-0.845	-0.805	3	5
Item 53	356	0	-0.136	-1.048	3	6
Item 54	356	0	-0.253	-0.541	3	6
Item 55	356	0	-0.357	-1.048	3	6

Table 9.1. Assessment of Normality the collected data

Source: By the authors.

Appendix 2 –Correlation among Variables

		Satisfaction	Functional	Epistemic	Emotional	Social	Conditional	perception of value	information seeking	information sharing	Responsible behavior	Personal interaction	participation behavior	Feedback	Advocacy	Helping	Tolerant	citizenship behavior	co-creation behavior
Satisfaction	Pearson Correlation	1																	
	Sig. (2-tailed)																		
Functional	Pearson Correlation	-0.048	1																
	Sig. (2-tailed)	0.367																	
Epistemic	Pearson Correlation	0.034	.154	1															
	Sig. (2-tailed)	0.521	0.004																
Emotional	Pearson Correlation	-.123	0.094	0.032	1														
	Sig. (2-tailed)	0.020	0.078	0.544															
Social	Pearson Correlation	0.016	0.007	0.070	0.022	1													
	Sig. (2-tailed)	0.767	0.898	0.188	0.682														
Conditional	Pearson Correlation	-0.064	0.059	0.046	0.032	0.007	1												
	Sig. (2-tailed)	0.228	0.264	0.386	0.544	0.896													
perception of value	Pearson Correlation	-0.057	.571	.577	.362	.506	.406	1											
	Sig. (2-tailed)	0.288	0.000	0.000	0.000	0.000	0.000												
Information seeking	Pearson Correlation	0.015	0.044	-0.024	.112	-.105	0.057	0.012	1										
	Sig. (2-tailed)	0.785	0.412	0.653	0.035	0.047	0.286	0.829											
Information sharing	Pearson Correlation	-0.006	.104	0.017	0.017	0.054	-0.003	0.033	.278	1									
	Sig. (2-tailed)	0.905	0.050	0.748	0.743	0.312	0.956	0.530	0.000										
Responsible behavior	Pearson Correlation	-0.047	.162	0.069	0.027	0.019	-0.038	0.090	0.036	0.009	1								
	Sig. (2-tailed)	0.373	0.002	0.193	0.611	0.723	0.474	0.092	0.502	0.864									
Personal interaction	Pearson Correlation	-0.066	-0.004	-0.006	0.028	0.030	-0.028	-0.020	-0.033	0.014	0.014	1							
	Sig. (2-tailed)	0.215	0.944	0.916	0.596	0.575	0.596	0.706	0.538	0.799	0.788								
participation behavior	Pearson Correlation	-0.045	.135	0.022	0.088	0.099	-0.002	0.049	.627	.633	.429	.457	1						
	Sig. (2-tailed)	0.395	0.011	0.684	0.099	0.061	0.974	0.361	0.000	0.000	0.000	0.000							
Feedback	Pearson Correlation	-0.028	0.088	0.031	0.087	0.009	0.102	.110	0.027	0.080	-0.049	0.067	0.064	1					
	Sig. (2-tailed)	0.595	0.098	0.555	0.101	0.864	0.056	0.038	0.611	0.130	0.359	0.206	0.230						
Advocacy	Pearson Correlation	0.001	-0.035	0.069	0.000	0.019	0.088	0.055	-0.057	-0.008	-0.061	-.128	-.116	0.033	1				
	Sig. (2-tailed)	0.978	0.514	0.197	0.996	0.716	0.096	0.299	0.288	0.878	0.248	0.015	0.029	0.532					
Helping	Pearson Correlation	0.015	0.024	-0.069	0.038	0.019	0.082	0.011	-0.029	-0.038	0.050	0.091	0.029	0.035	0.017	1			
	Sig. (2-tailed)	0.773	0.653	0.195	0.473	0.725	0.121	0.837	0.590	0.473	0.352	0.085	0.582	0.506	0.752				
Tolerant	Pearson Correlation	-0.001	0.009	0.039	0.031	0.064	0.063	0.083	-0.001	-0.064	0.003	0.016	-0.024	-0.003	-0.061	.178	1		
	Sig. (2-tailed)	0.991	0.861	0.459	0.562	0.225	0.235	0.118	0.978	0.228	0.958	0.769	0.658	0.960	0.249	0.001			

Citizenship behavior	Pearson Correlation	-0.001	0.025	0.035	0.062	0.031	,155*	,114	-0.038	-0.030	-0.025	0.001	-0.043	,354*	,558*	,597*	,554*	1
	Sig. (2-tailed)	0.984	0.644	0.505	0.246	0.554	0.003	0.032	0.472	0.576	0.637	0.991	0.418	0.000	0.000	0.000	0.000	
Cocreation behavior	Pearson Correlation	-0.033	,113	0.042	,107	0.047	,113	,118	,414*	,424*	,284*	,322*	,672*	,307*	,332*	,463*	,394*	,711*
	Sig. (2-tailed)	0.539	0.032	0.435	0.043	0.380	0.033	0.025	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

. Correlation is significant at the 0.05 level (2-tailed).

. Correlation is significant at the 0.01 level (2-tailed).

** . Correlation is significant at the 0.01 level (2-tailed). * . Correlation is significant at the 0.05 level (2-tailed).

Appendix 2 - Table 9.2. Correlation among Variables

Source: Own elaboration

Appendix 3 – Interview Guideline

About the participant:

Name:
Institution:
Position/role:
How and why was this person selected as an informant? And for which project/ projects?
Sex: M/F: _____

1. Can you briefly tell me about the game/simulation you use in your teaching process and how it came about?
2. Do you use this game/simulation by your own choice or is it a university choice?
3. How have you made use of game/simulation`s knowledge, products/resources in this course?
4. What was it about the game/simulation that made it useful/beneficial for your purposes? Based on your experience so far, in what ways could it have been more useful/beneficial for the higher education institution?
 - What is the purpose of utilization of this game/simulation in teaching process in your opinion?
5. What was it about the game/simulation that you accessed that gave you confidence to draw on it in your teaching process?
6. Who are the potential/actual students for utilizing the game/simulation in their learning process? How successful have you been to date in engaging that students?
 - Can you explain to me the type of engagement/participation/co-creation your students have had in the game/simulation?
 - Are they interacting with you or with other students? Do they have some social activity or work in groups in the game/simulation?
7. Do you see scope for future utilization of game/simulation in other subjects in higher education? If so in what way?
8. Based on your experience of utilization of game/simulation in your teaching process have you made use of information/models/tools or other knowledge products? If so, can you explain how?
9. Did you pass on any of these or discuss them with others? If so, please provide details.

10. What challenges (if any) have you experienced in trying to apply the game/simulation in your teaching process and how have you tried to deal with them?
11. What further information or products would help you in achieving your goals by applying game-based learning approach?
12. What lessons have you learned about successfully motivating students to co-create in game-based learning environment? What approaches have worked well/not so well?
13. What feedback did you receive from target students regarding their functional, social, emotional, epistemic and conditional perspectives of experiencing the game/simulation in their learning process?
14. In what way do you think this game/simulation will help students in the immediate future and in the long term future?

Appendix 4 – Questionnaire guideline

Dear student,

This study is part of a PhD project on Marketing and Strategy and aims to examine student satisfaction and co-creation behavior in a game-based learning environment in higher education. Thus, it is very important to understand your perceptions and behavior as a student regarding game-based learning

To your reference, game based learning includes using a variety of games, simulations, and applications as a dynamic learning method.

Your contribution is voluntary. Any information provided by you is anonymous and will not be attributed to you as an individual.

If you agree to participate in this study, please proceed to fill in this questionnaire. It should take no longer than 15 minutes. Your responses are very important to us.

Thank you very much for your time!

Please think on the benefits of the **last** game-based learning experience that you were involved for your education and professional expectations. Please indicate your level of agreement with the following statements in a scale between 1 (strongly disagree) and 7 (strongly agree).

1. My feelings towards the game-based learning are very positive.

1 2 3 4 5 6 7

2. The experience that I have had with game-based learning has been satisfactory.

1 2 3 4 5 6 7

3. In general, I am satisfied with the game-based learning.

1 2 3 4 5 6 7

4. Using game-based learning in my education will allow me to earn a good salary.

1 2 3 4 5 6 7

5. The utilization of game-based learning in my education will allow me to achieve my career goals.

1 2 3 4 5 6 7

6. The knowledge and skills I have acquired from game-based learning will allow me to get promotions.

1 2 3 4 5 6 7

7. It is better to obtain courses that used game-based learning before entering the workforce.

1 2 3 4 5 6 7

8. I believe employers are interested in hiring students who have experienced game-based learning in their education.

1 2 3 4 5 6 7

9. The quality of Knowledge and skills received from game-based learning influences the value of my degree.

1 2 3 4 5 6 7

10. Game-based learning influences the value of my education.

1 2 3 4 5 6 7

11. The number of students in groups using game-based learning influences the value of my education.

1 2 3 4 5 6 7

12. The guidance received from professors during the game-based learning affects the value of my education.

1 2 3 4 5 6 7

13. I learned new things from the game-based learning experience.

1 2 3 4 5 6 7

14. I like participating in game-based learning.

1 2 3 4 5 6 7

15. I am glad that I chose a program that offers me game-based learning.

1 2 3 4 5 6 7

16. The value of game-based learning depends on my personal effort.

1 2 3 4 5 6 7

17. Taking game-based learning has given me a sense of self-achievement.

1 2 3 4 5 6 7

18. Participating in game-based learning has boosted my self-confidence.

1 2 3 4 5 6 7

19. I am happy when playing these games/simulations/applications with my classmates.

1 2 3 4 5 6 7

20. I find game-based learning more interesting when participating with groups of friends.

1 2 3 4 5 6 7

21. Working in groups in game-based learning has a positive effect on the value of my education.

1 2 3 4 5 6 7

22. Social activities in game-based learning make my studies more interesting.

1 2 3 4 5 6 7

23. People who are important to me think that participating in game-based learning is a good thing to do.

1 2 3 4 5 6 7

24. The support materials supplied to me with the game/simulation/application on my course (e.g. study packs/texts) have helped my learning

1 2 3 4 5 6 7

25. Study-group work in the game-based learning has been a beneficial part of my course.

1 2 3 4 5 6 7

26. The game-based learning and its facilities have contributed to the value of my course.

1 2 3 4 5 6 7

27. The convenience of the game/simulation /application location (online) has contributed to the value of my course

1 2 3 4 5 6 7

Please think about your behavior during the last game-based learning. Please indicate your level of agreement with the following statements in a scale between 1 (strongly disagree) and 7 (strongly agree).

28. I have asked others for information on what game-based learning option the institution offers.

1 2 3 4 5 6 7

29. I have paid attention to how others behave to use these games/ simulations well.

1 2 3 4 5 6 7

30. I have searched for information on courses that use game-based learning.

1 2 3 4 5 6 7

31. I clearly explained what I wanted the lecturer to provide me regarding using the game/ simulations in this course.

1 2 3 4 5 6 7

32. I gave the lecturer proper information about my experience with the game/simulation/ applications.

1 2 3 4 5 6 7

33. I provided the necessary information about my experience with the game/simulation/ applications so that the lecturer could perform his or her duties.

1 2 3 4 5 6 7

34. I answered all the course's game-based learning related questions.

1 2 3 4 5 6 7

35. I fulfilled my responsibilities regarding the game-based learning.

1 2 3 4 5 6 7

36. I adequately completed all the expected behaviors.

1 2 3 4 5 6 7

37. I performed all the tasks that were required.

1 2 3 4 5 6 7

38. I followed the lecturer's directives or orders during the games/ simulations.

1 2 3 4 5 6 7

39. I was friendly to the lecturer and other students.

1 2 3 4 5 6 7

40. I didn't act rudely to the lecturer and other students.

1 2 3 4 5 6 7

41. I was courteous to the lecturer and other students.

1 2 3 4 5 6 7

42. I was kind to the lecturer and other students.

1 2 3 4 5 6 7

43. When I experience a problem using the games/simulations/ applications, I let the lecturer know.

1 2 3 4 5 6 7

44. If I have a useful idea on how to improve the games/ simulations/ applications, I let the lecturer know.

1 2 3 4 5 6 7

45. When I received good service from the institution staff regarding the utilization of the games/simulations/ applications, I comment about it.

1 2 3 4 5 6 7

46. I said positive things about the games/ simulations/ applications, the course to others.

1 2 3 4 5 6 7

47. I encouraged friends and relatives to attend the course and take the games/simulations/applications.

1 2 3 4 5 6 7

48. I recommended the game-based learning experience to others.

1 2 3 4 5 6 7

49. I assisted other students if they needed my help in games/ simulations/ applications.

1 2 3 4 5 6 7

50. I helped other students if they seemed to have problems using games/ simulations/ applications.

1 2 3 4 5 6 7

51. I taught other students to use the games/ simulations/ applications correctly.

1 2 3 4 5 6 7

52. I gave advice to other students regarding games/ simulations/ applications.

1 2 3 4 5 6 7

53. If the games/ simulations/ applications were not delivered as expected, I would be willing to put up with it.

1 2 3 4 5 6 7

54. If the games/ simulations/ applications had a mistake during service delivery, I would be willing to be patient.

1 2 3 4 5 6 7

55. If I had to wait longer than I normally expected to receive the service related to the games/ simulations/ applications, I would be willing to adapt.

1 2 3 4 5 6 7

56. What is your age?

57. What is your gender?

- Female
- Male
- Other

58. What is your country of birth?

.....

59. What was/is the name of the School where you participated in the last game-based learning experience?

60. What was/is the program you were/are taking when you participated in the last game-based learning experience?

61. What was/ is the name of the course in which you participated in the last game-based learning?

62. Which is the last game-based learning that you have/are participated/participating in?

- Digital educational games
- Digital applications
- Simulations
- Dynamic learning methods
- Other ——Which?——

63. If there is any additional information, regarding game-based learning that is not mentioned in this survey, could you please briefly explain it here.

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