Programa de Doctorado en Estadística, Optimización y Matemática Aplicada

Student eXperience Evaluation with Cultural Aspects

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I dedicate this doctoral thesis to my "lucesita"...

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Resumen

Este documento presenta un análisis en profundidad del trabajo realizado a lo largo del programa de posgrado, centrándose en el ámbito de la Experiencia del Estudiante (SX). El concepto de SX representa una instancia especializada de la Experiencia del Consumidor (CX), en la que el "cliente" es el estudiante que cursa estudios superiores. Una gestión eficaz de la SX tiene el potencial de mejorar significativamente la satisfacción del estudiante, elevando así la calidad percibida de las Instituciones de Educación Superior (IES). Dada la notable ausencia de metodologías de evaluación establecidas para la SX, este estudio se propuso desarrollar un enfoque integral y holístico para la evaluación de la SX. Dicho enfoque permite identificar tanto las debilidades como las fortalezas inherentes a los servicios educativos ofrecidos por las IES.

Nuestros objetivos de investigación se centraron en identificar los conceptos y factores clave relacionados con la SX, desarrollar un Modelo de Experiencia del Estudiante inclusivo y crear una metodología de evaluación validada y adaptada al contexto de la educación superior. Reconociendo la falta de integración de aspectos culturales en las soluciones de SX existentes, nuestro estudio adopta una perspectiva culturalmente informada. Para lograr esto, realizamos una revisión sistemática de la literatura (SLR), la cual facilitó la identificación de las dimensiones y factores tradicionales que definen el concepto de SX. Basándonos en estos conocimientos, formulamos nuestra propia definición de SX y, posteriormente, buscamos dimensiones y factores culturales relevantes en la literatura existente para consolidar un modelo de SX más integral que incorpore estos aspectos culturales.

El desarrollo de nuestro modelo de SX se basó en modelos culturales ampliamente reconocidos y validados, asegurando una base teórica sólida. Este modelo de SX enriquecido culturalmente sirvió como base para crear nuestra metodología de evaluación de SX, la cual sometimos a un proceso de juicio de expertos para su validación. A través de este proceso, expertos en el campo de la educación superior y la experiencia del consumidor proporcionaron valiosas opiniones, asegurando la credibilidad, relevancia y aplicabilidad de la metodología de evaluación propuesta en diversos entornos educativos.

Como parte de nuestro plan de estudios de posgrado, presentamos una versión preliminar de esta metodología de evaluación, junto con un plan de trabajo detallado que describe su implementación y posibles aplicaciones. Además, discutimos futuras oportunidades para ampliar y refinar el modelo de SX propuesto, subrayando la importancia de la inclusión cultural para mejorar la Experiencia del Estudiante en general. Esta investigación realiza una contribución significativa a los campos de la Experiencia del Estudiante, la Experiencia del Consumidor, la Educación Superior y la integración de Aspectos Culturales, ofreciendo un Modelo de Experiencia del Estudiante y una Metodología de Evaluación validados, que tienen un gran potencial para futuras aplicaciones y desarrollos.

Palabras clave: *Experiencia del Estudiante, Experiencia del Consumidor, Educación Superior, Aspectos Culturales, Modelo de Experiencia del Estudiante, Metodología de Evaluación, Inclusión.*

Abstract

This document presents an in-depth analysis of the work conducted throughout the postgraduate program, focusing on the domain of Student eXperience (SX). The SX concept represents a specialized instance of Customer eXperience (CX), wherein the "customer" is the student engaged in higher education. Effective management of the SX has the potential to significantly enhance student satisfaction, thereby elevating the perceived quality of Higher Education Institutions (HEIs). Given the notable absence of established SX evaluation methodologies, this study set out to develop a comprehensive and holistic approach to SX evaluation. Such an approach enables the identification of both weaknesses and strengths inherent in educational services offered by HEIs.

Our research objectives centered on identifying key concepts and factors related to SX, developing an inclusive Student eXperience Model, and creating a validated evaluation methodology tailored to the higher education context. Recognizing the gap in the integration of cultural aspects within existing SX solutions, our study adopts a culturally informed perspective. To achieve this, we conducted a systematic literature review (SLR), which facilitated the identification of the traditional dimensions and factors that define the SX concept. Based on these insights, we formulated our own SX definition and subsequently sought relevant cultural dimensions and factors from existing literature to consolidate a more comprehensive SX model that incorporates these cultural aspects.

The development of our SX model was informed by widely recognized and validated cultural models, ensuring a robust theoretical foundation. This culturally enriched SX model served as the basis for creating our SX evaluation methodology, which we then subjected to an expert judgment process for validation. Through this process, experts from the field of higher education and customer experience provided valuable insights, ensuring the proposed evaluation methodology's credibility, relevance, and applicability within diverse educational settings.

As part of our postgraduate study plan, we present a preliminary version of this evaluation methodology, along with a detailed work plan that outlines its implementation and potential applications. Additionally, we discuss further opportunities to extend and refine the proposed SX model, emphasizing the importance of cultural inclusion in enhancing the overall Student eXperience. This research makes a significant contribution to the fields of Student eXperience, Customer eXperience, Higher Education, and the integration of Cultural Aspects, offering a validated Student eXperience Model and Evaluation Methodology that holds promise for future application and development.

Keywords: *Student eXperience, Customer eXperience, Higher Education, Cultural Aspects, Student eXperience Model, Evaluation Methodology, inclusion.*

Executive Summary

This document outlines the planning, development, and validation of a four-year doctoral thesis project, aimed at developing a methodology for evaluating the student experience (SX) with a focus on cultural aspects. The doctoral project was conducted as part of a dual degree agreement between the Pontificia Universidad Católica de Valparaíso (PUCV) in Chile and the Universidad Miguel Hernández de Elche (UMH) in Spain. The project is structured into five stages:

i) A systematic literature review is conducted to understand the definitions of SX, its dimensions, associated factors, and commonly used evaluation methods.
ii) Cultural models present in the literature, which have been practically applied in UX/CX scenarios or educational projects, are investigated.
iii) The development of a theoretical SX model incorporating cultural aspects, serving as the conceptual basis for the development of the methodology and an evaluation survey.
iv) The development of an evaluation methodology.
v) Both the methodology and the created tools are statistically and expertly validated.

The stages of the project were successfully completed, resulting in the publication of three journal articles and seven conference papers with two articles ready to be published. Additionally, the development of the evaluation survey includes practical application cases conducted with undergraduate students from UMH and PUCV, specifically, surveys, and focus groups

The development and validation of the survey and evaluation methodology were carried out using samples of undergraduate students from diverse cultural contexts and nationalities. The voluntary participation of students from Chile and Spain was fundamental to this process. Future statistical validation includes the application of Structural Equation Modeling (SEM) to an already proposed model and reliability analysis of the collected data. Additionally, the methodology was reviewed by experts from multiple national contexts, genders, sectors, and areas of specialization, ensuring a comprehensive and robust evaluation. In addition to the theoretical foundations and the research context, the document includes two detailed appendices:

i) An explanation of the Business Process Model and Notation (BPMN) elements used in the modeling of the evaluation methodology processes.
ii) The BPMN diagrams detailing each stage and sub-stage that make up the SX evaluation methodology

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1. Introduction

The concept of Student eXperience (SX) is relatively recent but is rapidly gaining prominence within Higher Education Institutions (HEIs). Originating from the analysis of student experiences through a Customer eXperience (CX) lens, SX encompasses all the physical and emotional perceptions that a current or prospective student encounters when interacting with the products, systems, or services provided by an HEI. This concept inherently includes various aspects of a student's background, such as culture, gender, sexuality, physical disabilities, and perceptions of digital services. The development and implementation of SX-focused solutions have a substantial impact on learning outcomes and the overall well-being of students. Moreover, prioritizing SX serves as a catalyst for enhancing student engagement and offers a strategic advantage in the competitive landscape of higher education.

Effective management of the SX is of critical importance in today's educational environment. In recent years, several significant crises have posed challenges to both international and national (Chilean) educational systems. The migratory crisis [1] has contributed to demographic shifts and cultural clashes between migrants and local inhabitants, a phenomenon that also affects exchange students. The social unrest experienced in Chile has tested the security of university campuses and the transfer of technology [2, 3], while the COVID-19 pandemic has challenged HEIs' healthcare systems and technological infrastructures [4]. A thorough and accurate analysis of the elements that constitute the SX may offer solutions to some of these pressing challenges.

One of the most significant elements identified within the SX area is the role of cultural aspects. Culture influences multiple facets of a student's life and extends beyond purely academic considerations, playing a particularly crucial role for first-year and exchange students. Therefore, this study proposes an analysis of the relationship between culture and SX, aiming to develop an SX model that more effectively addresses the diverse needs of students, including cultural aspects that are often overlooked in SX evaluations.

Based on this culturally informed SX model, we have developed an SX evaluation methodology that incorporates the novel cultural aspects identified in this research. This methodology enables HEIs to conduct comprehensive diagnostic assessments that can enhance the quality of the services, products, and systems offered to students. Such an approach has the potential to improve both student satisfaction and the perceived quality of HEIs. Additionally, this document references a prior study focusing on the emotional aspects of SX [5]. This work has been included as it provides evidence that emotional factors constitute a significant dimension within the broader SX framework (specifically, the personal dimension).

2. Problem Statement

As mentioned in the previous section, developing solutions related to SX can enhance student satisfaction and improve the quality of higher education. However, working on SX currently has several drawbacks. SX is a fuzzy concept due to the abundance of definitions from different fields of knowledge, which are not always compatible. This lack of a unified definition hinders the development of effective SX solutions. Furthermore, although some authors emphasize the need to approach SX holistically, many studies analyze it within very specific case studies. This fragmented approach fails to capture the full scope of student experiences across diverse contexts. For these reasons, the initial work of our proposal was to carry out a Systematic Literature Review (SLR). SLRs allow the collection of reference documentation on a topic to subsequently respond to a series of predefined questions and clarify concepts based on compliance with defined criteria [6]. By conducting an SLR, we aim to establish a clear framework for the definition of SX. We will also determine if there is any existing SX model available, as well as identify the attributes, dimensions, and methods of its evaluation.

Upon completing the descriptive stage of our proposal, we find it necessary to analyze the relationship between culture and SX. This is due to the limited information regarding this relationship from a CX approach. Culture significantly influences students' perceptions, behaviors, and interactions within educational environments. Therefore, we propose an SX model that incorporates cultural aspects, which are vital elements of students' lives. The proposed model can be utilized to develop a wide variety of SX solutions, such as sets of usability heuristics in academic environments, design guides, or SX evaluation tools. In our doctoral research presented below, we focus on using the proposed model to develop an SX evaluation methodology that incorporates cultural aspects.

The choice to develop an evaluation methodology is based on the current lack of mechanisms that allow students' experiences to be evaluated holistically. Existing evaluation methods often overlook cultural factors, leading to incomplete or biased assessments. By developing a methodology that incorporates cultural factors, we aim to provide a more comprehensive tool for evaluating SX, thereby remedying this problem to a certain degree.

It is important to mention that the implementation of our proposal has the advantage of being inexpensive, more specifically, free. This applies to the processes of development, execution, and validation of the methodology. This is because the methods used do not incur additional costs beyond the work of the researchers directly involved in the proposal. This cost-effectiveness makes our proposal particularly attractive, as it offers an accessible alternative for institutions seeking to improve student satisfaction without incurring significant expenses.

3. Research Questions

By conducting our study we expect to answer the four following research questions. Also, it is important to mention that the initial work of our proposal was an SLR. The SLR shares the first 3 research questions with those of our proposal:

RQ1. What is (undergraduate) SX?
RQ2. What dimensions/attributes/factors influence (undergraduate) SX?
RQ3. What methods are used to evaluate (undergraduate) SX?
RQ4. How does culture influence (undergraduate) SX?

In the initial stages of our research, the first research question (RQ1) primarily enabled us to gain a comprehensive understanding of the state of the art in relation to the SX, as well as to ascertain whether a formal definition and model of SX existed within a CX area. The subsequent research questions, RQ2 and RQ3, facilitated the identification of the essential elements required to define an SX model and provided insights into the methods by which SX is evaluated in HEIs.

As our research progressed, we identified a significant gap in studies addressing SX that incorporate cultural elements. This observation led us to explore the cultural dimensions of SX in greater depth, resulting in the formulation of RQ4. This research question allowed us to gather valuable information regarding the significance of cultural factors in the SX, thereby demonstrating the practical feasibility of our proposal.

It is important to note that the aforementioned research questions are aligned with achieving the initial specific objectives outlined in the following section (Section 4). The answers obtained from these questions serve as the foundation for the development of appropriate SX solutions that integrate cultural factors. In our current work, for instance, we are in the process of formalizing an SX evaluation methodology that incorporates these cultural elements, ensuring a more holistic and contextually relevant approach to evaluating the student experience.

4. Main and Specific Objectives

As outlined in previous sections, the purpose of this document is to analyze the relationship between cultural aspects and SX, and to propose a model that facilitates the development of an SX evaluation methodology. The overarching aim of our research can be articulated through the following primary objective:

- **Develop an SX evaluation methodology that incorporates cultural aspects.**

To accomplish this primary objective, we have identified a set of specific objectives that will guide our research process. The attainment of these specific objectives is crucial to achieving the comprehensive integration of cultural elements into the evaluation of the SX. The specific objectives are as follows:

1. **Analyze the concepts present in the literature regarding SX:** This involves a thorough review and synthesis of existing research to gain a clear understanding of how SX is conceptualized, particularly within the context of higher education.

2. **Propose an SX model that incorporates cultural aspects:** Building upon the insights gained from the literature review, we aim to develop a comprehensive SX model that integrates cultural dimensions, ensuring that the model is both inclusive and representative of diverse student experiences.

3. **Formalize an SX evaluation methodology that incorporates cultural aspects:** Based on the proposed SX model, we will develop a structured and systematic evaluation methodology.

4. **Validate the proposed evaluation methodology:** Finally, we will undertake a rigorous validation process to ensure that the developed methodology is reliable, practical, and applicable in real-world educational settings, thereby confirming its effectiveness in evaluating SX with cultural considerations.

These specific objectives collectively contribute to the realization of the main goal and ensure that our research delivers a comprehensive and holistic SX evaluation methodology.

5. Research Methodology

Our research proposal adopts a mixed-methods approach, incorporating both quantitative and qualitative methodologies. A qualitative approach is necessary when working with the subjective perceptions of a specific user group. However, when correlating elements of SX, it is essential to employ a statistical framework, thus requiring quantitative methods.

Given the nature of our proposal, the scope of the investigation is correlational. The initial phase is exploratory, involving systematic literature reviews to gather important information about the SX concept. In this phase, we elucidate the existing theoretical framework on the subject and collect information that allows us to define the dimensions of SX based on related factors and elements.

The second phase is descriptive, wherein we develop the SX concept by explaining the dimensions that compose it and the factors that influence it. We use the information collected in the exploratory phase for this purpose. With the concept clearly outlined, we proceed to develop an SX model consisting of three dimensions: the social dimension, the educational dimension, and the personal dimension.

The subsequent phase of our proposal is correlational, as we aim to analyze how the different elements that compose SX are related to each other, with special emphasis on the cultural aspect. The variables addressed in this stage are the cultural models and the SX model, along with the factors related to the dimensions of these models. Analyzing the relationships between these models will allow us to establish a theoretical basis for developing the proposed SX evaluation methodology, which incorporates cultural aspects.

In the initial stages of our proposal, we primarily work with qualitative data. This includes the analysis of cultural models, analysis of SX models, search for definitions, and analysis of SX evaluation methods and tools. Once an SX model with cultural aspects has been defined, an SX evaluation methodology will be developed, executed, and validated. This methodology utilizes both quantitative and qualitative data. Tools such as property checklists, interviews, focus groups, perspective-based inspections, and group-based expert walkthroughs primarily work with qualitative data. The use of the heuristic evaluation method has both quantitative and qualitative components (expert opinion and scoring). The application of surveys with open and closed questions also provides quantitative and qualitative data, including student opinions and ratings on Likert scales. It should be noted that, as input to the methodology, we will utilize data previously used by HEIs, such as teaching evaluations, results of previous surveys, and market studies. These data can be both quantitative (metrics) and qualitative.

As mentioned in previous sections, in the initial phase of the postgraduate program a SLR was carried out. That review was performed based on the framework for literature review in software engineering proposed by Kitchenham [7], which includes the following three phases:

- **Planning the review**, which includes the process of defining research questions and strategies to carry out the review.

- **Conducting the review**, which includes the specification of inclusion/exclusion criteria, data extraction and article selection.

- **Reporting the review**, which requires the presentation and discussion of the results.

To ensure the quality of the review, we have incorporated the checklist of elements proposed by the PRISMA methodology, focusing on improving the realization of systematic literature reviews and meta-analysis [8]. Subsequently, with the information collected in the SLR, we will proceed to associate the SX dimensions and factors with national culture elements. This will allow the consolidation of a SX model that incorporates cultural aspects. With this model, an SX evaluation methodology will be developed. The complete development process can be seen in Figure 1., whose stages are detailed below:

1. In the first stage of our work, an SLR is carried out in order to know the different definitions of SX, the interest areas, the dimensions/factors/attributes that make up the SX, and the methods used to evaluate the SX.

2. In the second stage of our work, the factors and dimensions of the national culture in the literature are analyzed. These elements will be contrasted with those found in the previous stage, referring to the SX dimensions.

3. In the third stage of our work, a union of the factors and dimensions detected in the literature regarding the SX and the national culture is carried out. Aspects that do not apply to the dimensions union may be excluded.

4. In the fourth stage of our work, a model will be developed with the factors and attributes resulting from the union from stage 3. The model proposed in this stage can be refined based on the results of application of the proposed evaluation methods.

5. In stage 5 of our work, an SX evaluation methodology will be developed and validated. That methodology will incorporate cultural elements. The methodology will be constantly refined after an iterative application. The iterative application of the evaluation methodology will also allow us to refine the proposed SX model from stage 4. We intend to submit the evaluation to expert analysis, carried out by professionals linked to educational environments as well as experts in UX and CX areas.

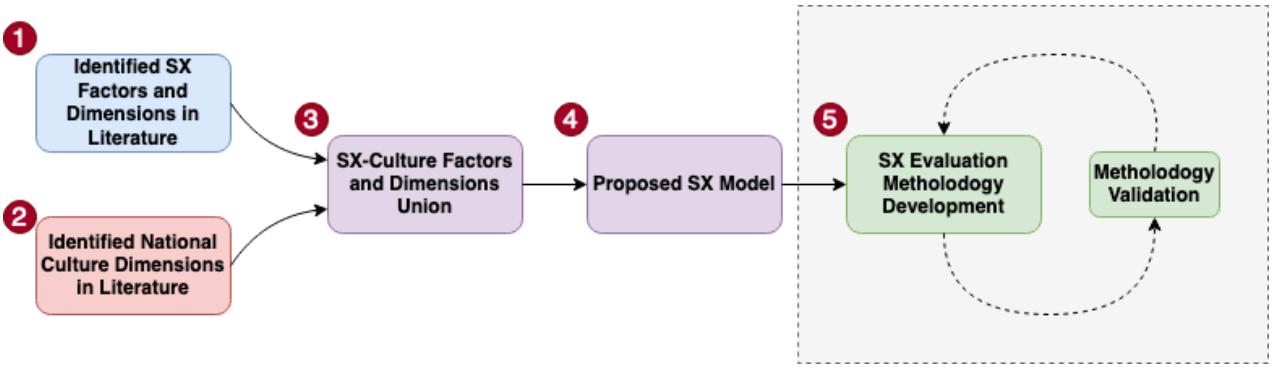

Figure 1. Doctoral Research Workflow.

In summary, the initial stage of this postgraduate research focuses on conducting a comprehensive review to establish a foundational understanding of SX concept, including its definitions, key dimensions, factors, and evaluation methods. This foundational work sets the stage for analyzing how national cultural elements intersect with the dimensions and attributes of SX, enabling the development of an integrated SX model that effectively incorporates cultural aspects.

As the research progresses, the integration of SX and cultural dimensions will be refined, resulting in a consolidated model that accurately reflects the interplay between SX and cultural influences. This model will then serve as the basis for developing a holistic SX evaluation methodology, which will undergo rigorous validation and iterative refinement to ensure its applicability and relevance in diverse cultural and educational environments.

The ultimate objective is to produce a robust and adaptable SX evaluation methodology that not only incorporates cultural considerations but is also capable of evolving through expert feedback and practical application. This comprehensive approach will contribute significantly to the understanding and enhancement of the student experience, offering a valuable tool for higher education institutions seeking to address the complex and dynamic nature of student engagement and satisfaction in a culturally diverse context.

6. Work Plan

The development of the activities are part of the doctoral program in computer engineering of the Pontificia Universidad Católica de Valparaíso and the doctoral program in Statistics, Optimization and Applied Mathematics of the Universidad Miguel Hernandez de Elche.

For this reason, the activities are related to the academic courses of the program. The activities are planned to be done on the dates defined by the educational institution; for the evaluation and presentation of results. Below is a tentative work plan with the activities to be carried out throughout the 3 years and a half contemplated by the doctoral program. It should be noted that the aforementioned work plan is subject to possible modifications, with the exception of activities related to mandatory courses. Those are: Thesis seminar, Thesis project, Research stay, and their corresponding presentations. Table 1., 2., 3., and 4. present the activities that will be carried out throughout the doctoral program.

2021 Work Plan		
Activity	**1st Semester**	**2nd Semester**
Conduct a literature review on the SX concept	**X**	
Development of an article on emotional aspects and SX: "Emotions and Student eXperience: A Literature Review"	**X**	
Development of an article on the SX concept (SLR): "Student eXperience: A Systematic Literature Review"	**X**	**X**
Completion and publication of the SLR article on the SX concept		**X**
Identification and formalization of SX dimensions/factors/attributes		**X**
Tentative solution proposal		**X**

Table 1. 2021 planification.

2022 Work Plan		
Activity	**3rd Semester**	**4th Semester**
Identification and formalization of SX dimensions/factors/attributes	**X**	
Thesis project development	**X**	
Development of an article on cultural aspects and the SX dimensions: Analyzing the Impact of Culture on Students: Towards a Student eXperience Holistic Model	**X**	
Thesis project presentation/ Candidacy exam	**X**	
Develop a SX model that incorporates cultural aspects	**X**	**X**
Development of an article about a SX model that incorporates cultural aspects		**X**
SX evaluation methodology development		**X**

Table 2. 2022 planification.

Our planning for the years 2023 and 2024 includes conducting our research proposal from an international location outside of Chile. It is important to emphasize that undertaking this work abroad will enable the development of a more robust and comprehensive proposal, as well as facilitate its validation. Working in a different country will provide access to diverse academic resources, allow collaboration with international experts, and expose us to varied cultural and educational perspectives. These opportunities are expected to significantly enhance the quality and rigor of our research, thereby strengthening its contributions to the field.

2023 Work Plan		
Activity	**5th Semester**	**6th Semester**
Research stay abroad	**X**	
SX evaluation methodology development	**X**	**X**
Research on practical application of the proposed methodology	**X**	**X**
Development of an article about the SX evaluation methodology development (preliminary)		**X**
Methodology validation by expert judgment		**X**
Statistical model validation		**X**

Table 3. 2023 planification.

2024 Work Plan		
Activity	**7th Semester**	**8th Semester**
Methodology validation by expert judgment	**X**	**X**
Statistical model validation	**X**	**X**
Validate proposed model	**X**	**X**
Doctoral thesis development	**X**	**X**
Development of an article about the SX evaluation methodology (executed and validated)	**X**	**X**
Presentation of Doctoral Thesis		**X**

Table 4. 2024 planification.

7. Background

7.1. User eXperience

User experience (UX) is the result of subjective perceptions of the use of goods and services in a given context. The ISO standard 9241-210 defines UX as follows: "person's perceptions and responses resulting from the use and/or anticipated use of a product, system or service". UX incorporates elements such as emotions, personal beliefs/preferences, perceptions, physiological/psychological responses, behaviors and the achievement of activities that occurred before, during, and after the use of a product or service [9]. UX is a concept closely related to CX, which extends the analysis of user interactions with a single product, system, or service to all interactions with a brand, through the products, systems and services that it offers. In this way, the concept of the user gives rise to the concept of the customer. The concept is relevant in our study given that, as a client, students are the users of services, products and systems offered by higher education institutions (HEIs).

7.2. Customer eXperience

Although the term CX has been widely discussed, it does not have a clear, standardized definition. CX has been considered as "the physical and emotional experiences occurring through the interactions with the product and/or service offering of a brand from point of first direct, conscious contact, through the total journey to the post-consumption stage" [10].

Gentile et al. (2007) consider that CX has six dimensions: emotional, sensorial, cognitive, pragmatic, lifestyle and relational [11]. The emotional component involves the affective system, through the generation of moods, feelings, and emotions. The sensorial component involves stimulation, which affects the senses. The cognitive component is involved in thinking and conscious mental processes. The pragmatic component is involved in the practical act of doing something. The lifestyle component is related to the values and the beliefs of a person, and the adoption of certain lifestyles and behaviors. The relational component involves the person, social context, and relationships with other people.

Other authors such as Lemon and Verhoef, have defined CX as "a multidimensional construct focusing on a customer's cognitive, emotional, behavioral, sensory, and social responses to a firm's offerings during the customer's entire purchase journey" [12]. This definition makes it clear that the relationship between customers and companies exceeds the threshold of merely physical. Additionally, it mentions the concept of a customer's "journey", which is of great importance when analyzing CX. Touchpoints are vital elements for analyzing customer's journeys. They have been defined as a representation of: "(…) a specific interaction between a customer and an organization. It includes the device being used, the channel used for the interaction, and the specific task being completed." [13].

7.3. Culture

Culture is a fundamental element of societies. Analize culture can explain the way in which we relate to our environment and perceive external stimuli. According to Hofstede (1991), culture refers to “the collective programming of the mind that distinguishes the members of one group or category of people from another” [14]. In this way, the importance of cultural aspects for students is evident. The identification of cultural aspects in the SX could allow us to analyze the satisfaction or dissatisfaction degree that students experience throughout their university life. It is important to mention that the analysis of cultural aspects is especially important in refugee and exchange students. This is because in those cases it is more likely that a culture shock will occur when the values of the students conflict with those of the local people. Also, the analysis of the cultural background of the students plays an important role when implementing teaching methodologies and promoting inclusion policies in HEIs.

A concept closely related to the cultural aspects of students is that of adaptation. The adaptation of students with their environment is, especially in situations of cross-cultural interactions, influenced by their cultural background and that of the receiving society. In his work, Lysgaard (1955) identifies a "U-shaped" curve to describe the process of cross-cultural transition. This model details the perceptions of an individual using two axes. The curve begins in a good state of mind (honeymoon) and progresses in time towards a cultural crisis, before beginning an adjustment process [15]. Lysgaard's model was later extended (Gullahorn and Gullahorn, 1963) to a “W-shaped” curve. The new model incorporates into the equation the period of return of individuals to their places of origin. This means that after an initial cultural adjustment in a foreign culture, individuals once again experience a cultural crisis and a process of adjustment when they return to their origin cultures [16].

Student cultural integration and re-integration process is evidently very important to ensure student satisfaction. It is important to mention that the integration of the student is included in the student journey which has a considerable temporary extension in the student life cycle. For this, to develop a holistic SX model, it is necessary to consider, in addition to cultural factors, the processes of cultural adjustment (integration and re-integration).

When we refer to cultural aspects, a clear distinction and definition of concepts must be made. A very important term and totally different from culture is the cultural identity. This refers to the degree in which people identify with a certain culture. In this way, culture is an unconscious attribute and cultural identity is a conscious one [14,17]. Cultural identity plays an important role in SX. The students' cultural identity is related to the students' sense of belonging. For this reason, although culture can define the degree to which a student can adapt to an environment, it is through cultural identity that the student can externalize their perceptions, feelings and emotions.

Hofstede's work is recognized as one of the most relevant regarding the influence and impact of culture on people [14,18,19]. Although it should be noted that the national culture dimensions proposed by him are not the only ones, in addition to having a large number of works that extend his model. Hofstede's work has been used extensively to develop cross-cultural solutions. Hofstede has long developed a model in which he identifies six dimensions of national cultures: (i) Power distance, (ii) Uncertainty avoidance, (iii) Individualism/collectivism, (iv) Masculinity/Femininity, (v) Long/short term orientation and (vi) Indulgence/restraint. We believe that these dimensions, which have already been used to develop culturally focused solutions, can also be used to develop an SX model.

7.4. Student eXperience

The Student eXperience (SX) is a widely used concept, which lacks a general agreement regarding its meaning. We recently carried out a SLR on the SX concept [20]. As a result of this work it was possible to define the concept from a CX perspective, where the students are a particular case of customer. In this way, the SX are all the physical and emotional perceptions and reactions that a student or future student experiences in response to interaction with products, systems or services provided by a HEI, and interactions with people related to the academic field, both inside and outside of academic space.

We have identified that SX has 3 dimensions (Figure 2.). This is based on the factors commonly treated in investigations in the educational field and the student experiences evaluation methods. The dimensions correspond to:

1. **Social Dimension**: This dimension is related to community relationship and institutional engagement. Although students constantly interact with people in a society, this dimension focuses on interpersonal relationships within HEIs (student-student) and especially with interactions with staff (student-administrative and student-educator for example). Along with the interactions, this dimension analyzes the feeling of institutional belonging, or engagement, of the students.

2. **Educational Dimension**: This dimension is related to Students' Learning Engagement, Higher Education Quality, Learning Resources/Learning Environment, and Educational/Support Services. This dimension encompasses any aspect that focuses on promoting an adequate educational environment or maximizing the educational outcomes of students (teaching methodologies, technological infrastructure, educational support networks). Consequently, these aspects translate into a positive perception of the quality of the HEI, which is why quality has been incorporated into this dimension.

3. **Personal Dimension**: This dimension is related to Student Development and Outcomes, Student Feelings and Emotions, Environment Relationship, Student Thoughts, and students' Identity and Background. Personal aspects of each student's life that may influence interactions and perceptions with HEI services and products are considered, albeit indirectly. This dimension encompasses aspects related to culture, socioeconomic level, disabilities, personal aspirations, family structure, leisure, among others.

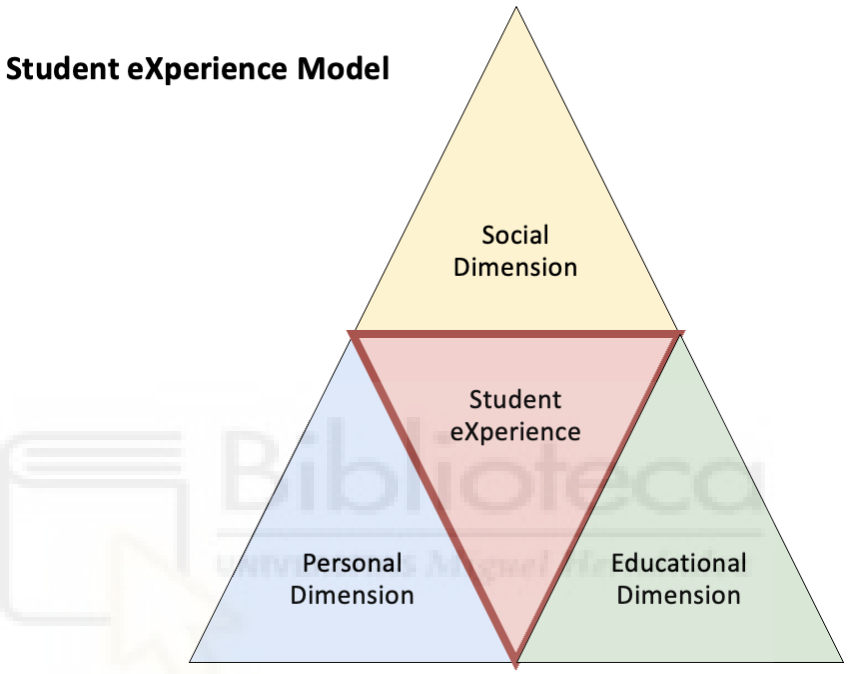

Figure 2. Student eXperience Dimensions.

In section 8 we detail the SLR procedure, results, and analysis that results in our SX dimensions proposal.

7.5. Cultural Aspects in Student eXperience

Culture has a huge impact on SX and the day-to-day students' lives. Evidence obtained in the exploratory phase of our study indicates that cultural aspects are inherent in the daily lives of students. Additionally, the evidence in the literature indicates that it has an important role in the learning outcome and the overall well-being of the students. This is most evident in first year and exchange students. Taking the aforementioned into consideration, we find it important to analyze how cultural aspects are related to SX, and to propose an SX model that incorporates those aspects.

It should be noted that the evidence in the literature shows that cultural aspects are not part of the SX analysis process; culture is usually treated as a student background element in studies that refer to SX [20]. This shows the possibility of developing SX solutions that, unlike traditional models, incorporate cultural aspects.

At the current development stage of our proposal, we have found evidence that links the proposed SX dimensions with cultural aspects typically addressed by cultural models. These models consist mainly of Hofstede's National Culture Dimensions and models that expand the dimensions proposed in that model. An exhaustive analysis of the SX-Culture relationship is carried out in section 11 of this document.

7.6. Scientific Novelty

The SX, as a specific case within the broader field of CX, remains relatively underdeveloped and lacks a universally accepted definition. This absence of consensus contributes to inconsistencies in how SX is understood and addressed across different studies and applications. Research that analyzes or proposes solutions for SX often tends to neglect aspects of significant importance to students [20], particularly cultural factors. This oversight can result in solutions that are not fully effective or inclusive, as they fail to consider the diverse cultural backgrounds and needs of the student population.

Developing an SX model that incorporates cultural aspects is essential for constructing a foundational theoretical framework. Such a framework will serve as a critical tool for developing future solutions in the field, where a deep understanding of the "customer"—in this context, the student—is imperative. An SX model enriched with cultural considerations can be utilized to create more efficient heuristics sets, CX evaluation tools, usability guidelines, and other resources. These tools would be better equipped to address the nuanced experiences of students from various cultural backgrounds, thereby enhancing the effectiveness of educational programs and services.

For the purposes of this postgraduate research, we will focus on developing an SX evaluation methodology that integrates cultural aspects. To achieve this, we will employ the proposed SX model after thoroughly defining the SX concept, identifying the dimensions and factors that influence it, and analyzing current methods used to evaluate SX. This comprehensive approach aims to fill existing gaps in both literature and practice by providing a culturally sensitive methodology for evaluating the student experience. By incorporating cultural factors into the evaluation process, we anticipate that the resulting methodology will offer more accurate insights and foster improvements that are more closely aligned with the diverse needs of the student body.

8. Student eXperience: A Systematic Literature Review

The satisfaction of people's needs is undoubtedly an element of vital importance for the consolidation of a brand or company in the market. This may become even more complex when considering the perceptions of customers that interact with an organization. Customer experience (CX) refers to people's expectations, emotions and interactions with a brand through systems, products, and services, and should be a priority in the market; it has been pointed out that its proper administration can lead to a differential advantage for service organizations [21].

CX requires observing the interaction between a customer and a brand, which is done through the contact points between them. Touchpoints are the instances in which the customer comes into contact with an organization throughout the whole customer "journey". These touchpoints can be both physical and logical. Touchpoints consider communication devices and channels, as well as tasks performed by customers [13].

When we think that students consume products and services, in addition to interacting with university software systems, the relationship between CX and SX becomes evident. Students are a particular case of customers in the field of education. For this reason, it is possible to construct a definition of SX from the perspective of CX.

As a first step in our research, a SLR has been carried out. The main objective of this SLR is to know precisely what definitions of SX have been adopted in the literature, as well as the factors and dimensions with which they have been developed. The design and results of that work are presented below.

8.1. Research Questions

We oriented the SLR to the following topics: (1) SX definitions, (2) dimensions/attributes/factors regarding SX, and (3) methods that are used to evaluate SX. Table 5. presents the three research questions (RQ) that guided our study.

ID	Research Questions (RQ)
RQ1	What is (undergraduate) SX?
RQ2	What dimensions/attributes/factors influence (undergraduate) SX?
RQ3	What methods are used to evaluate (undergraduate) SX?

Table 5. Research questions used in the review

8.2. Literature Search

In the literature review we examined the literature published within 10 years (from 2011 to June 2021), indexed in five databases: Scopus, Web of Science, Science Direct, IEEE Xplore, and ACM Digital Library. In all five databases we searched for the following keywords: "student experience" and ("higher education") or "undergraduate". The number and percentage of studies available in each database are listed in Table 6.

Database	Number of Studies	% Studies
Scopus	3114	71.1%
Web of Science	800	18.3%
Science Direct	390	8.9%
IEEE Xplore	59	1.3%
ACM Digital Library	15	0.3%
Total	4378	100%

Table 6. Search results in databases using the keywords.

8.3. Study Selection Criteria

We searched for studies focusing on SX, in all areas, including all types of research methods. The inclusion criteria are presented in Table 7. As indicated in the table, the study was limited to SX in higher education, at the undergraduate level, excluding highly technical applied cases (such as the analysis of the student's experience in highly specialized work environments), and strictly pedagogical articles. This is because SX integrates multiple elements of the student's life (such as culture, emotions, education, commitment), and, therefore, should be approached from a holistic perspective.

ID	Category	Criteria
IN1	Inclusion	Articles published between 2011 and 2021
IN2	Inclusion	Articles referring to research questions
EX1	Exclusion	Studies focused on levels other than undergraduate
EX2	Exclusion	Strictly pedagogical articles
EX3	Exclusion	Highly technical applied cases

Table 7. Study selection criteria for this review.

8.4. Study Selection

By applying the selection criteria, we gathered 65 studies. Figure 3. shows the search and selection process flow, applying the inclusion and exclusion criteria in each step, and removing duplicates.

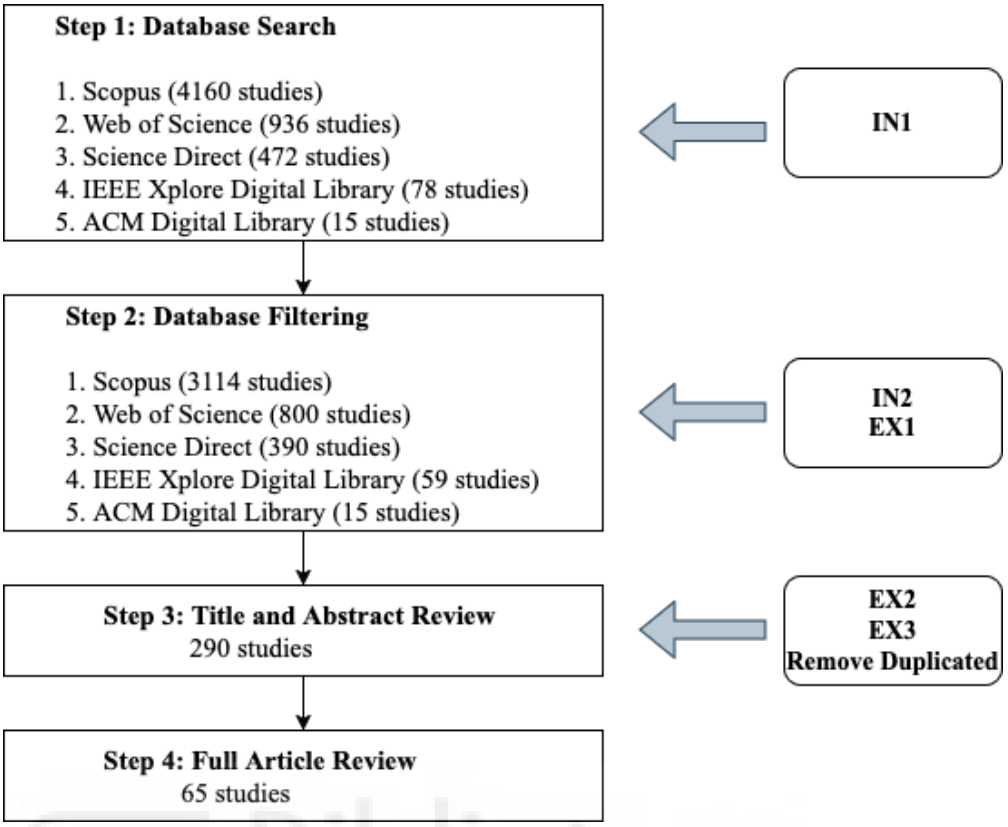

Figure 3. Flow chart with the results of the study selection process.

8.5. Data Synthesis

The review includes the data synthesis of the 65 studies selected for a full review. This analysis consists of the summarization and tabulation of the studies, identifying: (i) publications over the years, (ii) document type, and (iii) subject area.

8.5.1. Year of Publication

The distribution of documents published over the years shows continuous growth. This highlights the increasing interest in the research on SX. Additionally, Figure 4. shows that, although the year 2021 is in progress at the time of the review (June 2021), it is possible to forecast that the increasing trend will continue.

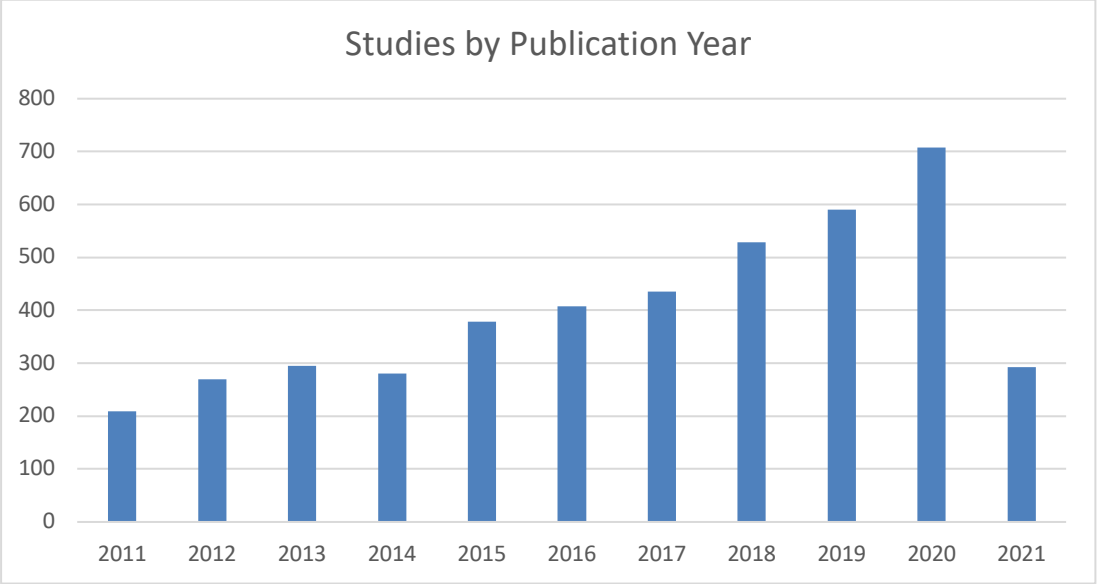

Figure 4. Studies published by year.

8.5.2. Document Type

We analyzed the document types of the studies reviewed. Documents are classified into books, book chapters, reviews, conference papers, and journal articles. The vast majority of the 65 studies selected were journal articles (53), followed by book chapters (6), conference papers (3), and reviews (2). Books had the smallest number of documents (1). Figure 5. shows the document type distribution of selected studies.

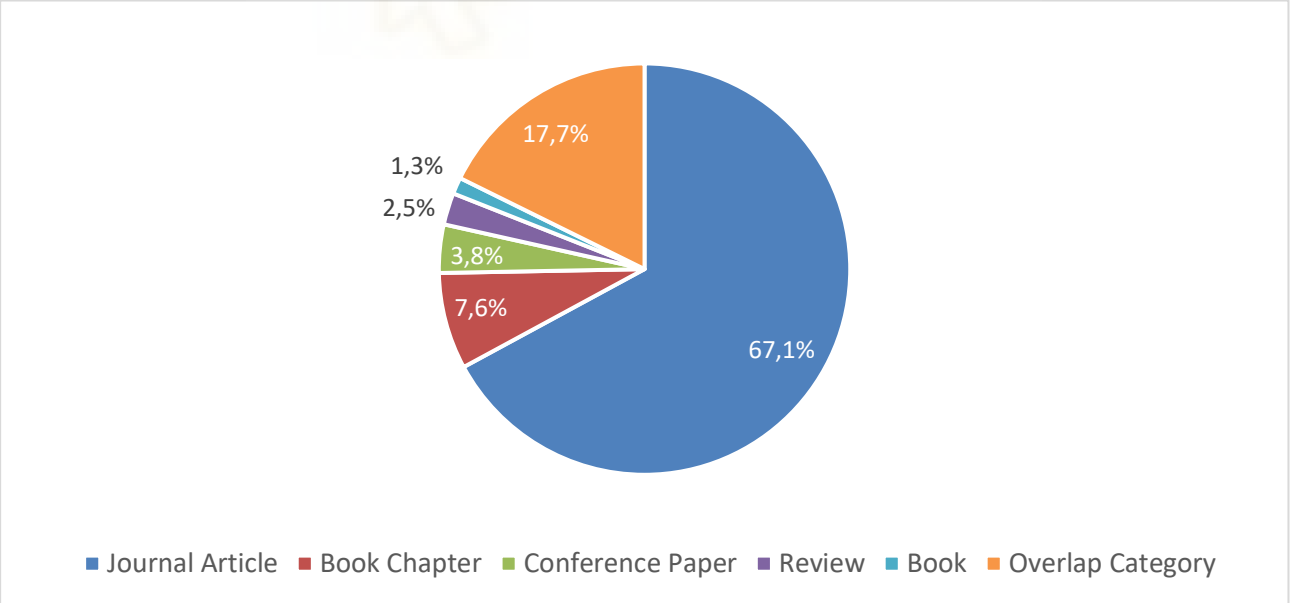

Figure 5. Document type.

8.5.3. Subject Area

Figure 6. indicates the distribution of the selected studies according to their subject area; the six subject areas are the ones that databases are using when categorizing the documents. The vast majority of studies are in the area of "Social Sciences" (40), while the areas with the smallest number of studies are "Tertiary Education and Management" (1), and "Education/Educational Research" (1). We point out the importance of the considerable number of studies with a multidisciplinary approach (19), which highlights the need for a multisectoral approach to SX.

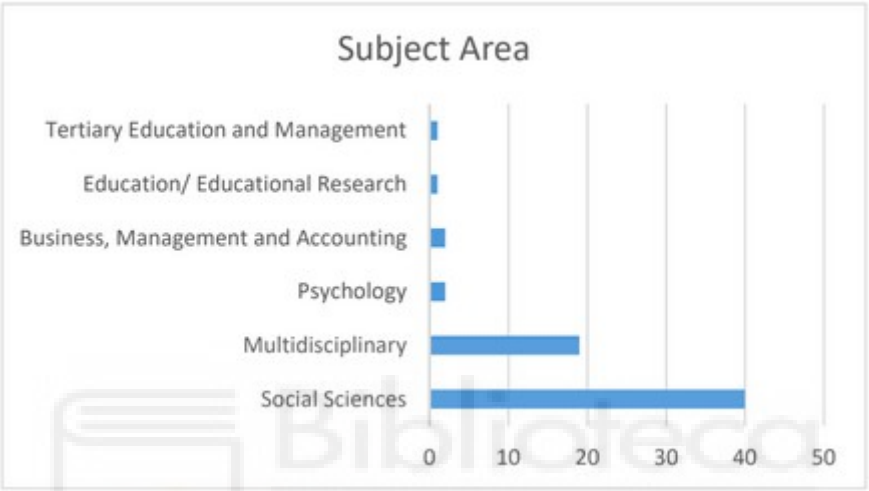

Figure 6. Studies subject area.

8.6. Answering the Research Questions

8.6.1. RQ1: What Is (Undergraduate) Student eXperience?

The SX concept is relatively new [22]. The concept emerged driven by a fundamental change in the higher education sector, where teaching centered on the student and oriented toward learning processes began to be prioritized. However, over the years, SX has been defined in multiple ways [23]. This is not a minor conceptual problem.

Tan et al. pointed out inconsistencies when defining the SX concept [24]. The "experience" definition is, on the other hand, diffuse and, in many cases, the term is, "as the concept of value", rarely well defined [25, 26, 27]. Despite the problems of inconsistency, the SX concept makes a clear reference to the experiences of students. Even so, it is sometimes difficult to distinguish between such experiences and students' everyday life experiences [28]. SX has become a topic of great interest, especially in the past decade (2010's), in academic and learning environments [29]; very few studies have focused on the students' holistic experiences [30].

This concept has been widely used in universities for advertising purposes. In this way, universities offer an "excellent student experience" in order to attract customers/students [31]. SX shows a trend in the use of the concept as an indicator of quality and/or satisfaction. Authors such as Farhan and Carey have pointed out that, since the focus of HEIs is on student satisfaction, it is possible to observe consumer attributes in students [32, 33].

Since the emergence of the concept, it has been referred to as a strictly pedagogical field. This has changed over the years. Baranova et al. have observed how the conception of the student experience has evolved, including, in addition to the learning and teaching experience, the interaction of students with the administrative and support services of HEIs, outside the classroom [34]. Douglas et al. defined SX within the academic sphere as the "experience of higher education teaching, learning and assessment and their experience of other university ancillary service aspects" [35]. Other examples of the definition of the concept outside the classroom are those of Harvey and Knight, and Arambewela and Maringe, who use the term "total student experience" to refer to experiences lived by students in contexts broader than the physical place of learning [36, 37].

It is important to point out that the learning experience, being related to the learning outcomes of the students, directly influences students' academic success. Kahu et al. also observed how the academic success of students, as well as the awareness of that feeling, influence student engagement, as well as other factors that we have covered in this section [38].

Pötschulat et al. analyzed the SX concept from a sociological point of view. They concluded that the use of the concept tends to be a political intervention, in view of its sociological inadequacy. They also point out that the use of the concept smuggles in a market logic that homogenizes the elements in which it could be composed [39]. We believe that not only a poorly focused market logic can homogenize the elements of the student's experience, but also any superficial approach to the concept. The blurring of the elements that compose SX can make it difficult to evaluate.

Detaching the concept from the academic field, Baird and Gordon have said that the SX concept refers to the various experiences of subjects while they are students. Similarly, Temple et al. defined SX as the totality of a student's interaction with the institution, contemplating the interactions carried out outside the merely academic field [40, 41]. Rahim and Jusoh mentioned that the term SX refers to the "student learning and living development at higher educational institutions starting from early admission to the university until graduation" [42].

The trend towards a broader approach to the SX concept is evident when we observe new concepts that involve experiences in different contexts. An example of this are the terms "student transitions" [43,44], "trajectories" [45] or "pathways" [46], which make clear reference to the students' journey.

Despite the focus on teaching and learning in which SX has been addressed, there is evidence in the literature that focuses on students as customers [47, 48, 49, 50]. Within the less typical views in the market, students have been analyzed as active customers [51], citizens [52], and co-producers [53,54]. In this way, the active role of students comprises student– academic collaboration relationships for the production of knowledge, and student–society relationships, where the student is analyzed as part of society and the relationship of convenience between them is ethically analyzed. Part of the research carried out in this matter has addressed a vision of the education market dealing with the discourse of the value of co-creation, where students contribute their capacities to the construction of the educational system [55, 56, 57, 58]. This point is important because, as a result of the interaction of students with HEIs, it is possible to create value. This highlights the mutual benefits of the student–HEI relationship.

The value of co-creation by the customer has been analyzed by Prahalad and Ramaswamy, and identified as the experience of a specific customer, at a specific point in time and location, in a specific interaction context [59]. As a result of students' value creation, their role as a customer is once again evident. Gupta and Vajic have related customers' experiences with the knowledge acquisition process, saying that "an experience occurs when a customer has any sensation or knowledge acquisition resulting from some level of interaction with different elements of a context created by the service provider" [60].

It should be noted that there have been criticisms of the public policies that have introduced a market logic into education and have placed the student as a mere customer [61, 62]. Research that criticizes market logic focuses on two aspects. First, the impact of new management practices on academic work and identity [63, 64, 65]. Second, the negative impact on students' expectations and experiences, since there has been a transition from student to learner, where they are pushed to take responsibility for their own learning as independent, self-directed individuals [66, 67, 68, 69]. Jæger and Gram analyze the Chinese and Danish exchange student context, pointing out marketization in education approaches; national and transnational discourses, and government and institutional policies are factors that influence consumer orientation among students [70]. The economic model by which HEIs are financed does not only include the factors that affect consumer orientation.

For us, and like Dollinger and Lodge, the large quantity and variety of definitions of the SX concept denotes an evident diversity of the conceptualization of experience in higher education [71]. This undoubtedly represents a problem, considering that in the literature a direct relationship between SX and student satisfaction is made, and satisfaction is pointed out as an indicator of quality in HEIs [36,72], understanding satisfaction as the positive difference between expectation and perceptions. In this way, it is possible to see how various evaluation mechanisms (such as SERVQUAL and National Student Survey (NSS)) have been used to assess SX, which, according to multiple authors, is not sufficient or adequate for this task, in determined contexts. Table 8. indicates the different approaches to the SX concept and the associated.

Approach	Studies
Academic	[29, 34, 35, 36, 37, 38, 42]
Student Journey	[43, 44, 45, 46]
Sociological	[39]
Holistic	[28, 30, 36, 37, 40, 41, 71]
Customer	[31, 32, 33, 47, 48, 49, 50, 51, 52, 53, 54, 56, 57, 58, 61, 70]
Market Logic	[61, 62, 64, 65, 66, 67, 68, 69, 70]
HE Quality	[36, 72]

Table 8. Studies approaches to the SX concept.

8.6.2. RQ2: What Dimensions/Attributes/Factors Influence (Undergraduate) Student eXperience?

The concept of SX is treated in a wide number of studies using different approaches, depending on the specific goals of each research. As Mieschbuehler mentioned "the term student experience can be found everywhere" [31]. In addition, a predominant approach to learning and teaching was observed, focusing on the student learning experience and learning outcomes.

After conducting an exhaustive analysis of the studies in the literature, we can indicate that the studies usually focus on three topics: (i) on learning and teaching, where the methodological and technological aspects that allow increasing learning outcomes and facilitate teaching are analyzed, including evaluative processes; (ii) on engagement/commitment, where the sense of belonging, partnership and engagement/commitment between the students and the HEI are analyzed; and (iii) on the wellbeing of the students, where the sensations and feelings of the students are analyzed, as well as their overall wellbeing and interpersonal relationships. This is similar to that observed by Bista, who mentions that the perspectives of international students' experiences include sociocultural identities, contextual influences on their learning experiences, their wellbeing experiences, and their post study experiences [73]. Bates et al. have identified main themes referring to students' experiences, such as "Learning Environment", "Work–Life Balance" and "Wider University Community" [23].

Kahu and Picton have analyzed first year students' experiences using photo elicitation. They analyzed the information provided by the students thematically and categorized it, focusing on three dimensions of their experience: life, university and learning [74]. Other authors have highlighted the use of surveys focused on students' experiences, such as the Australian Student Experience Survey (SES) [75,76]. This survey categorizes its questions into five conceptual groups related to satisfaction: learner engagement, teaching quality, learning resources, student support, and skills development [77]. Additionally, a study by Hong et al. analyzed the trends in which the SX was addressed.

These trends are "First-year transitions", "Student engagement and outcome", "Student experience in learning", and "Quality management and service satisfaction", among others [78]. Tan et al. realized, through a literature review, the prevailing research streams when speaking of "student experience". These are "exploration of learning experience", "exploration of student experience", "gender differences in assessment of higher education experience", "improvement in quality of student experience", and "student satisfaction with higher education experience" [24].

Hailikari et al. observed that the focus on learning and teaching in SX is the most common, generally referring to strictly academic environments and factors. For good reason, they mention that the experience of the students is affected by more factors [79]. Furthermore, student learning experience in HEIs is also a multifactorial issue that is affected by environmental variables, such as the HEI's infrastructure, classroom quality, residential facilities, IT facilities, and sports facilities [80]. Ruhanen et al. analyzed students' experiences in a tourism immersion internship. In their work, it was observed how the expectations, experiences and satisfaction of the students are directly related to their learning experience [81].

From the point of view of technological support, Barret et al. addressed the role that learning technologies and learning management systems play in improving students' experiences. This is evidenced in the learning outcomes of students [82]. Likewise, Yu and Bryant analyzed the use of technology in the learning experience of students, and the consequent impact on their lives. Although the impact of technology on SX and on learning outcomes is notable, the lack of studies linking these elements is evident. As Yu and Bryant said "we know little about how students' personal, digital and educational lives intersect and shape their learning experience" [83].

The prevailing focus of teaching and learning on SX has led to the development of tools that can increase student satisfaction. This is the case of the User eXperience Design for Learning Honeycomb framework, which aims to create valuable online learning experiences. Troop et al., analyzed the use of this framework and detected four aspects in the online platform's design that students find valuable: accessibility, usefulness, intuitiveness, and desirable [84].

There are surveys that allow us to get notions about the learning experience of students, more specifically, their learning outcomes. Douglass et al. used, in their study, the Student Experience in the Research University Survey (SERU-S), which allows accountability for assessing and reporting learning outcomes in higher education [85].

Students' engagement in relation to students' experiences is one of the most frequently observed themes in the literature regarding SX. Student engagement has been associated with other elements of SX, such as student learning and achievement [86]. Studies carried out with the Student Experiential and Engagement Value Index (SEEVI) have made clear the close relationship between students' engagement with HEIs, and their experience [87]. Student engagement is influenced by many factors, such as sense of belonging, institutional commitment, student satisfaction, and the quality of the students' experiences [88]. Chambers and Chiang have used the National Survey of Student Engagement (NSSE) to analyze students' perceptions about the issues that challenge them to develop skills, awareness, confidence, and other factors that influence their engagement. The close relationship that exists between engagement and the experience of students is evident [89].

Meehan and Howells analyzed the impact of students' experiences in HEIs and their sense of belonging. In their work, they concluded that "the students' states of being, belonging and becoming are critical to understand in order to engage students for a successful experience in higher education" [90]. It is evident that the sense of belonging and the engagement of the students are closely linked, and that sense of belonging plays a vital role in the wellbeing of the students. Similarly, Naylor et al. highlighted the importance of students' sense of belonging while reducing their stress levels, to improve their experience. This also reduces the risk of dropping out [91]. Other authors directly relate student retention with increasing students' satisfaction by improving their experience [92].

Both sense of belonging and workload stress have been validated, together with feeling supported and intellectual engagement, as elements that serve to evaluate the experience of students. In this way, the crucial role that the affective aspects of students have, in terms of the quality of their experiences, is revealed. In addition, student engagement has been related to student happiness, which has implications for students' experiences and overall wellbeing [93].

Grebennikov and Shah, monitoring trends in student satisfaction, have realized the importance of satisfaction in student engagement. If students had good and satisfactory experiences, they were more reluctant to drop out of their studies. In this way, the relationship between the wellbeing of students and engagement is evident, which is one of the focuses most approached in the literature regarding SX [94].

Dominguez-Whitehead has analyzed the role of nonacademic support services in SX, considering that students' experiences extend beyond the academic context. The analysis of nonacademic services is related to personal, institutional, and interpersonal factors. Investigating the relationship between students' experiences with nonacademic services can offer alternatives for rectifying problems and concerns related to nonacademic service provision, improving students' experiences and wellbeing [95].

Smith and Segbers analyzed the impact of interculturality on students' experiences [96]. This is important, because through good practices that address intercultural education situations, financial, educational, and cultural benefits can be achieved. It is also important to mention authors who have pointed out cultural differences in learning, which certainly affects the perception of quality in HEIs and the experience of the students [97]. Tan et al. observed that gender differences in the assessment of higher education experience is a common research stream in studies that analyze students' experiences [24]. In this way, it is evident that the experience of students is subject to factors specific to individuals, such as their own gender. Similarly, Jayadeva et al. observed that students' perceptions of higher education vary depending on factors specific to individuals and their environment, such as national contexts, and may be mediated by factors such as educational quality perceptions [98].

Another example of SX assessment under specific contexts is observed in the work of Brady et al., who developed a survey to analyze the perspectives and experiences of STEM (science, technology, engineering, and math) students in historically black colleges and universities (HBCUs) [99]. African American students' experiences in HBCUs can differ significantly from those in other communities, and in other HEIs, considering the racial segregation that has taken place in the USA over the past century. It has been observed that some HEIs outperform others because of the alignment between the values and aspirations of the students with those exhibited by their HEI [75].

It is important to mention that the experiences of students who transition to higher education turn out to be an important factor in terms of their learning outcomes and engagement [100]. As the experiences of first year students have such a significant impact on their perception and academic results, it is possible to explain the large number of studies focused on this group of students [39, 74, 90, 91, 101, 102].

SX has been addressed in a large number of studies using different approaches. While these approaches are well suited to providing a satisfying experience, and can complement each other, factors unique to the student's life should not be omitted. Cheeseman has considered that the experience of students does not strictly refer to the relationship between students and their HEI, but encompasses aspects of the students' day to day lives [103]. Students' personal experience, familial experience, institutional experience, national milieus, class, ethnicity, gender, race, religion, sexual orientation, or responsibility for dependents, are factors that influence SX [67, 104, 105, 106].

We share Sabri's critique on the conceptualization of the "student experience" as a means of discriminating between the value of different educational experiences [61]. We believe that this occurs due to the multiple factors inherent to the student's life that are overlooked, either by the surveys or the research approaches.

In view of the studies analyzed in this review, we categorized the factors that influence the student experience into three dimensions. To achieve this, we analyzed the approach of the studies referring to SX, the conceptual groups attended, and the elements considered in evaluation scales that address the subject. The results shown in Table 9. describe the observed dimensions of SX and the factors related to each dimension. In addition, studies related to these factors are included.

ID	Category	Criteria
Social Dimension	Community Relationship	[34, 71, 80, 83, 95, 101, 104, 107, 108, 109, 110]
	Institutional Engagement	[38, 73, 80, 86, 87, 88, 89, 90, 91, 92, 94, 99, 101, 102, 107, 108, 109, 111, 112, 113, 114, 115, 116, 117, 118]
Educational Dimension	Learning Engagement	[30, 34, 38, 42, 74, 79, 80, 86, 87, 88, 89, 91, 92, 94, 99, 102, 108, 117, 118, 119, 120]
	Higher Education Quality	[24, 37, 47, 50, 71, 72, 76, 89, 94, 97, 111, 121, 122, 123, 124, 125, 126]
	Learning Resources/Learning Environment	[23, 29, 48, 75, 78, 79, 82, 83, 84, 86, 88, 104, 112, 118, 120]
	Educational/Support Services	[73, 82, 91, 95, 110, 115,119,127]
Personal Dimension	Student Development and Outcomes	[30, 42, 80, 85, 89, 108, 127]
	Student Feelings and Emotions	[23, 80, 83, 91, 93, 109, 110, 128]
	Environment Relationship	[39, 71, 89, 103, 104, 108, 109, 118]
	Student Thoughts, Identity and Background	[23, 24, 25, 28, 30, 31, 33, 35, 36, 37, 39, 40, 41, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 56, 57, 58, 61, 63, 64, 65, 66, 67, 68, 69, 70, 71, 73, 74, 75, 76, 78, 79, 80, 81, 82, 84, 89, 90, 92, 94, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 108, 110, 112, 113, 114, 115, 118, 119, 120, 121, 127, 128]

Table 9. Observable SX dimensions.

In the social dimension, we found factors related to the interaction of students with the various actors and entities that provide services in HEIs. This includes relationships with educational staff, HEIs helpdesks, classmates, and tutors, among others. In addition, this dimension includes students' institutional engagement, as this is generated mainly from interactions between entities.

In the educational dimension, we found factors related to the learning experience of students, which determine their learning outcomes and success. In this way, aspects such as teaching quality, learning resources, student educational support and learning engagement are included.

In the personal dimension, we found factors related to aspects of the life of each student. Some factors in this dimension are difficult to evaluate using standardized tools. This dimension includes aspects such as gender, socioeconomic level, cultural background, state of health, emotions, skill development, and day to day experiences, among others. The emotions experienced by students are particularly important, as they affect short and long term adaptational outcomes in higher education [129].

It should be noted that, sometimes, the factors mentioned above do not refer to having an effect on a single dimension of the student's experience but may also affect factors typically associated with other dimensions.

8.6.3. RQ3: What Methods Are Used to Evaluate (Undergraduate) Student eXperience?

Evaluating SX is of growing interest among various governments and HEIs. As a result of efforts to improve student satisfaction, frameworks and scales have been proposed to measure students' satisfaction, and overall student experiences in HE. Otherwise, student experience is typically measured using policy driven metrics [23]. This is the case with tools such as the NSS [130], NSSE [131], SES, Course Experience Questionnaire (CEQ), and variations of the SERVQUAL scale, to evaluate satisfaction with educational services in different case studies. In addition, some tools have focused on engagement aspects, such as SEEVI [76].

All the tools mentioned above have in common the characteristic of gathering opinions directly from students. While this is a positive aspect, it is hardly sufficient. Nair et al. have pointed out the importance of the commitment of the university, faculty management and academic staff to address students' issues correctly [121]. In this way, it is evident that the various mechanisms to evaluate the experience of students must be matched with appropriate measures to effectively improve student satisfaction.

The term "student experience" is usually associated with students' perceived satisfaction. In the words of Meehan and Howells, "measuring student experience in terms of satisfaction is a national measure used by prospective students when considering their higher education choices" [101]. Ammigan and Jones have analyzed the degree of satisfaction that international students perceive in the different dimensions of their university experience. By performing a regression analysis on the data obtained from the students, they were able to identify four dimensions of satisfaction related to students' experiences: arrival experience, learning experience, living experience, and support services experience [119]. To carry out their study, they relied on the International Student Barometer (ISB), which tracks and compares the decision making, expectations, perceptions and intentions of international students, from application to graduation [132].

Student satisfaction and student experience are often measured in terms of the quality of services or products that HEIs offer to them [107]. Additionally, the quality of the services offered is usually measured in terms of teaching [111, 122, 123]. In view of the dimensions that we have analyzed in this article, it is evident that a quality approach focused solely on teaching is a mistake.

The relationship between student experience, quality, and satisfaction is more evident when we analyze the relationship between students' experiences and university accreditation, carried out by agencies such as the Quality Assurance Agency (QAA) in the UK [124]. Camgoz-Akdag and Zaim have worked with the five dimensions of SERVQUAL as a basis for proposing a conceptual model of student satisfaction. In this study, the quality variables perceived by the students were related to their satisfaction and, thus, to their overall SX [125].

SERVQUAL [133] is one of the most widely used scales to evaluate students' perceptions of the services delivered at HEIs. Even so, this scale does not seem to be efficient in certain contexts, which is why many studies modify this service quality scale depending on their objectives. Vaughan and Woodruffe-Burton tested a disabled user specific service quality model (ARCHSECRET) [126], as opposed to a modified version of SERVQUAL, in the context of disabled students. In practice, this model turned out to be more efficient in the specific case of students with disabilities [127]. For cases such as the previously mentioned, it is valid to assume that it is not possible to develop a single model that is capable of evaluating the perceptions and satisfaction of students, without disregarding elements of their personal lives.

We found several studies aimed at measuring student satisfaction, taking into account rather "unusual" elements. Shahijan et al. have examined the experiences of international students' satisfaction with HEIs. In their work, they focused on measuring the experiences of international students, as well as their satisfaction level and perceived performance [112]. This is a complex task, considering that the international student experience is a multidimensional issue influenced by various personal and cultural factors [104]. Meehan and Howells conducted a study to analyze the perceptions of first year students, regarding students' experiences and satisfaction. For this work, they used the Student Experience Evaluation (SEE) instrument and the National Student Survey (NSS). Their analysis identified three elements that influence the students' experiences and satisfaction: the academic staff they work with, the nature of their academic study, and their sense of belonging [101].

Satisfaction measurement extends to the use of more scales than just SERVQUAL. This is the case in studies that have used the UK NSS, which is very popular [76]. This is usually considered in the student evaluations of teaching (SET) cases of study. However, this survey was also criticized. Zaitseva et al. have used concept mapping software in their studies to aid in the interpretation of the qualitative data from student satisfaction surveys. In this way, they were able to identify aspects of SX beyond the survey questions. In their studies, they have mentioned the importance of being cautious with statements that imply that survey results are representative of the entire student experience [108]. For her part, Sabri criticizes the role of the NSS, arguing that it has nuances that cause the tool to exceed its validity or intended use [109].

Although student experience is usually measured in terms of student satisfaction, multiple governments and organizations do so in terms of the quality of products and services provided by HEIs using quality indicators (e.g., sufficiency of learning resources, classroom design, and achievement of learning outcomes) [50].

For their part, Naylor et al. have defined, in their work, four scales to measure students' experiences at university: "belonging", "feeling supported", "intellectual engagement", and "workload stress" [91]. These scales can be related to some of the dimensions in which we have observed that the student experience is analyzed, mentioned in Section 8.6.2., such as "Learning Engagement", "Student Feelings and Emotions", and "Educational/Support Services". It is interesting to mention the work of Tan et al., in which it was observed that one of the major streams of research on student experience quality in HE refers to student satisfaction with the higher education experience [24]. Thuy and Tao analyzed the impact of students' experiences on brand image perception. Unlike most studies, they adopt the experiential marketing view, which uses the SERVQUAL scale as the basis for measuring students' evaluations of HEI products or services. In their work, students' experiences attributes related to brand image perception, such as in classroom sensations and behaviors, affective experiences, and relationships, were analyzed [113].

As mentioned in Section 8.6.2., the factors that organizations focus on when analyzing the experience of the students are institutional and learning engagement. These are commonly evaluated together, with the related "student experience" to be used as a reference for future students regarding "good" places to study [114]. Thus, the focus on engagement is usually presented as a market focus. Regarding engagement, several studies have used their own measurement scales. This is the case in the work of Musa and Saidon, where the Student Experiential and Engagement Value Index (SEEVI) is used [87]. In this way, it is evident that the use of different measurement tools, with different approaches to students' experience, can be particularized to the analysis of specific SX factors. Similarly, Chambers and Chiang have studied how students perceive elements that challenge them to develop skills, awareness, and confidence. To accomplish this, they utilized the NSSE. As a result of their work, information has been provided to improve students' experiences, focused on three categories of high importance: "Academic experience"; "Social experience", and "Campus environment" [89].

Khalifa et al. studied the perception and engagement of higher education students of and with the various tangible and intangible services provided by their HEIs. For this work, they used the College Student Experiences Questionnaire (CSEQ) [134], which is intended to measure the quality of SX. The findings of this study show that students with disabilities experience less satisfaction with intangible services. This shows how the experience and perceptions of students vary depending on factors inherent to the students' lives [115].

Beck and Milligan investigated the factors that influence the institutional commitment (IC) of students, especially in online education. To do this, they relied on the College Persistence Questionnaire (CPQ) [116]. In their work, aspects of students' experiences were identified as predictors of IC [117]. In this way, the existence of a relationship between the SX and the IC is clear. In the work of Barrie et al., the development of an SX survey was reported, which highlights the aspects that influence SX. In the authors' words, this survey helps HEIs staff to "identify the extent to which student engagement is maximized" [118]. This again shows the relationship between students' experiences and their engagement. Moss and Pittaway analyzed the importance of student expectations and engagement regarding HEIs during their transition stage. For this, they analyzed the student journey by identifying key touchpoints for online students in transition [102].

The holistic approach to SX has the drawback of being more difficult to assess. As we incorporate more elements to ensure an adequate approach to genuine students' experience, the analysis becomes complex. If we add to this problem the specificity of each student journey, we find ourselves, according to Heron, in a situation in which no survey or questionnaire can give a certain account of the genuine experiences of students [110].

Dollinger and Lodge, analyzing the value in SX, mention that the student satisfaction measurement should be holistic, and not one dimensional, or analyzed only at the "end of an experience" [71]. In their study it was determined that the student–staff partnerships may enhance value in the students' experiences. This statement complements the ideas that we have raised in previous sections, where the interpersonal relationships of students (both inside and outside the classroom) directly contribute to their engagement and satisfaction. In this way, the overall student experience is improved.

Bevitt mentioned the need for an innovative assessment of student experience in higher education. For this, and in accordance with our judgment, it is necessary to use a holistic approach when evaluating SX. According to the author, the "assessment for student experience must be viewed as a complementary layer within a complex multi-perspective model of assessment" [120]. In our opinion, the process of evaluating SX has two major difficulties. First, students' perceptions are unique, personal, and subjective, which is why SX is difficult to analyze using standardized tools. Second, a student's journey is very broad and complex, and many dimensions must be evaluated. We believe that two levels of evaluation should be used.

The first level should focus on the very nature of the touchpoints, to more accurately assess the perceptions of the students, considering a mixed approach (quantitative and qualitative). It should examine a student's interaction with specific services, products and systems, such as educational services, the use of information technologies for learning, and psychoeducational support services. The second level of evaluation should focus on the holistic experience of a student, considering personal aspects of the individual; scales such as SERVQUAL usually ignore cultural and/or emotional aspects. An article indicates the complexity of CX evaluation [135].

As we have observed, SX is often evaluated in terms of satisfaction. A complete SX evaluation would allow HEIs to improve the quality of their services. The instruments used for this work, which generally use self-reported methods, can encourage universities to adapt and improve their service, shaping their courses and changing the way they relate to students [94]. Table 10. shows the different evaluation instruments and the number of studies in which they were mentioned.

Evaluation Instrument	Number of Studies
National Student Survey (NSS)	[3 Documents]
National Survey of Student Engagement (NSSE)	[1 Document]
Student Experience Survey (SES)	[2 Documents]
Student Experience Evaluation (SEE)	[1 Document]
Student Experiential and Engagement Value Index (SEEVI)	[1 Document]
International Student Barometer (ISB)	[1 Document]
SERVQUAL	[3 Documents]
Course Experience Questionnaire (CEQ)	[1 Documents]
ARCHSECRET	[2 Documents]
College Student Experiences Questionnaire (CSEQ)	[1 Document]
College Persistence Questionnaire (CPQ)	[2 Documents]

Table 10. Instruments to evaluate SX aspects.

8.7. Discussion

The term "student experience" is widely used in the literature, but unfortunately there is currently no general consensus on the term. For this reason, it is possible to find a large variety of definitions with specific approaches related to the specific purposes of each study. In addition, it has been criticized that some works using the SX concept are theoretically poorly developed [25,27]. It is worth mentioning that, in this study, we have focused on the experience of undergraduate students.

In general, the SX term is used with academic approaches and refers to the experiences of students in the context of learning and teaching, that is, learning experiences. However, it is possible to find a diversity of approaches in the literature. Among the articles that we have analyzed, the experience of students is conceived as the totality of their perceptions and interactions with different educational services, staff, and peers, while they are students.

In this study, we included some documents that did not meet some of the selection criteria. This is because some of these articles are important for conceptualizing SX as a relatively new concept [22], a topic of great interest [29], and define SX both within the academic sphere [35], and with a holistic perspective [36, 37]. Other articles are relevant to understanding the student as a customer, since they contextualize the student as a co-producer [53, 54, 55]. Other documents are useful for understanding some aspects of the student's life that influence SX, such as culture, day to day aspects, and emotions [105, 106, 129].

We found articles that analyze the SX concept from a customer experience approach, where the student is considered a client of educational products and services. This approach has been criticized, since it has been pointed out that the introduction of a market logic in higher education can homogenize the elements that compose the student's experience [38].

In view of the articles analyzed in this review, we categorized the factors that influence the students' experiences in three dimensions, analyzing the focus of the articles, the concepts covered, and the elements considered in the associated evaluation scales. The analyzed studies focused mainly on three aspects, learning and teaching, student engagement/commitment, and student wellbeing.

The observed dimensions were: (i) social dimension, which comprises relational aspects between students and the various actors with whom they interact throughout their university life, i.e., educators, HEI staff, classmates, service assistant; (ii) educational dimension, which includes factors that influence the student learning experience, i.e., learning resources, student educational support, teaching methodology; and (iii) personal dimension, which includes aspects of the student's life, i.e., sex, socioeconomic level, cultural background, health status, emotions, feelings, skill development, and day to day experiences. Within the personal dimension, it can be observed that very few articles that deal with the SX concept directly address students' emotions. This is a problem, considering that customer emotions are a critical part of the CX. Added to this is the problem that emotions and feelings are not considered as variables to estimate customer satisfaction [128, 136].

The evaluation of SX is typically conducted by assessing students' levels of satisfaction, often utilizing self-reported methods to gather the necessary data. Commonly employed scales for this purpose include the NSS and modified versions of the SERVQUAL model adapted to specific educational contexts. Additionally, a variety of instruments, such as the NSSE and the SEEVI, are used to evaluate different facets of the student experience. These surveys and questionnaires are frequently designed to assess the quality of education and the performance of HEIs, underscoring the central role that student satisfaction plays in the quality assurance processes of these organizations. It is evident that positive student experiences directly contribute to increased satisfaction, thereby enhancing the perceived quality of educational offerings.

However, evaluating the SX presents significant challenges due to the complexity of the student journey and the inherently personal and subjective nature of individual experiences. Given this complexity, we recommend that SX evaluation be conducted at two distinct levels. The first level should concentrate on the characteristics and quality of individual touchpoints—the specific moments of interaction between the student and the institution. The second level should adopt a more holistic perspective, analyzing the entirety of the student's journey to capture a comprehensive understanding of their experiences.

In this context, we conceptualize SX as encompassing all physical and emotional perceptions experienced by a current or prospective student in response to interactions with the products, systems, or services provided by an HEI, as well as interactions with individuals connected to the academic environment, both within and outside of traditional academic settings. This definition takes into account a wide range of influencing factors that shape the student experience, including cultural background, gender identity, sexual orientation, physical disabilities, and other elements that affect the overall development and well-being of students. By adopting this multifaceted approach, the evaluation of SX can more accurately reflect the diversity and complexity of student experiences, thereby providing valuable insights for enhancing educational quality and student satisfaction.

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9. Emotions and Student eXperience

During the first semester of the doctoral program, a literature review was conducted to examine the relationship between affective aspects and the SX [5]. Although this review was completed prior to the research focusing specifically on the cultural aspects of SX, it was undertaken with the intention of identifying and defining the elements that constitute the SX. This work is particularly relevant, as subsequent findings from the SLR on the SX concept and its dimensional framework have demonstrated that emotions are intrinsically linked to the SX Personal Dimension. The detailed results of this literature review are presented in this section, highlighting the critical role that affective factors play in shaping the overall student experience.

9.1. Emotions

Although there is no general agreed definition for "emotions" in the scientific community, several definitions and theoretical models have been outlined, in different areas. Sherer has defined emotions according to the framework of the component process model as "an episode of interrelated, synchronized changes in the states of all or most of the five organismic subsystems in response to the evaluation of an external or internal stimulus event as relevant to major concerns of the organism" [137, 138].

The role of emotions and their impact on SX are important, since emotional stimuli can occur as a result of student-HEI interactions in different touchpoints. Affective analysis is important in first-year students, since it has been observed how emotions have effects over short- and long-term adaptational outcomes [22]. It is important when talking about emotions to emphasize that these are part of the affective process of people, which is a broader concept.

Affection is a cognitive process that involves the relationship of organisms and includes feelings, in addition to emotions. The study of emotions is especially relevant in the area of affective computing. In it, systems and devices for cognition, interpretation, and processing of users' emotions are analyzed and developed. This is an interdisciplinary field that is usually framed within the HCI. Evaluating emotions in SX is an important aspect. It is evident that given the large number of topics that the SX encompasses [78] assessing students' emotions may be complex. This difficulty is also influenced by the need for multidimensional evaluation models [139].

9.2. Research Method

9.2.1. Research Questions

We oriented the literature review to the following elements: (1) the topics that deal with emotional aspects regarding SX, (2) the impact of emotions on SX, and (3) the methods that are used to evaluate emotions in the SX. Table 11. presents the research questions (RQs) that guided the study.

ID	Research Questions (RQ)
RQ1	What kind of topics address the emotions in SX?
RQ2	How do emotions affect SX?
RQ3	What methods are used to evaluate emotions in SX?

Table 11. Research questions utilized in the LR about emotions on SX.

9.2.2. Search Strategy

We examined the literature published within the last 5 years (from 2015 to 2021), indexed in five databases: Scopus, Science Direct, Web of Science, ACM Digital Library, and IEEE Xplore. The search strings were formulated based on the relevant topics to the literature review. In all five databases we searched for three terms, using the following conceptual string search: "Student experience" and ("Emotions" or "Affective"). The number of indexed studies in each database and the percentage of contribution to the total results are described in Table 12.

Database	Number of articles	% of articles
Scopus	356	70.9%
Science Direct	89	17.7%
Web of Science	45	9.0%
ACM DL	8	1.6%
IEEE Xplore	4	0.8%

Table 12. Search results in databases using the search strings.

9.2.3. Studies Selection

We searched for studies focusing on the impact of emotions on SX in all areas and including all types of research methods. The inclusion criteria are described in Table 13. As indicated in Table 14. the study was limited to higher education experiences, at undergraduate level.

ID	Inclusion Criteria (IN)
IN1	Articles regarding the research questions
IN2	All field/disciplines, and all type of research methods

Table 13. Inclusion criteria for the review.

ID	Exclusion Criteria (EX)
EX1	Articles out of time range
EX2	Articles that do not focus on higher education students

Table 14. Exclusion criteria for the review.

We fully analyzed only a selected number of articles that we found more relevant for the research topic. We also have to point out that our review also includes articles that did not meet some of the previously mentioned criteria, but we find them highly relevant [140, 141, 142, 143, 144, 145, 146]. It is important to mention that this study is a non-systematic literature review, so the management of duplicate articles is not a major issue.

9.3. Answering the Research Questions

9.3.1. RQ1: What Kind of Topics Address the Emotions in Student eXperience?

The students' experiences are developed in a wide range of topics, such as: learning [84, 147, 148, 149], role of services [150], educational transition [151, 152], and engagement [153, 154, 155]. We observed that the articles focus broadly on 3 categories: i) Pedagogical approach, where the learning experiences and outcomes are analyzed, ii) Focus on engagement, where the student-HEI commitment and their motivation are analyzed, and iii) Focus on student well-being, where the emotional health of students is analyzed.

It should be noted that all the articles analyzed used self-reported methods to collect information regarding the emotions of the students, such as questionnaires and interviews. In one article text mining was subsequently used to analyze the data obtained [147].

9.3.2. RQ2: How do Emotions Affect Student eXperience?

Regarding the impact of emotions in SX, the role of emotions in learning experiences is the most discussed aspect in the literature. Reisenzein & Döring have proposed that emotions have three properties: i) immediate awareness, ii) phenomenal quality, and iii) intentionality [140]. According to them, the learning experiences would be involved in all these 3 properties. Several studies highlight how emotions directly affect students' motivation, which influences their learning process. Goebel & Maistry have observed the effect of emotions on motivation, behavior and outcomes in economic learning [148]. Troop et al. have investigated User eXperience Design Learning (UXDL) and have observed its effect on student motivation, which improves their learning outcomes [84]. This is due to the effect of the material design that encourages the learner's attention to relevant information [144], and the willingness to engage with these material [145].

The student's attitude in learning experiences is not passive. Rentzios et al. explored the relationship between emotional regulation, defense mechanisms, and learning. The study makes explicit the role of defense mechanisms as mediating factors in the relationship between academic emotions and learning. This relationship is more evident when an immature defense style is observed on the part of the students [149].

The role that services have in SX is remarkable, especially in the field of learning experiences, motivation and performance. Tan et al. have analyzed the relationship between students and educational services, focusing on the importance of empathy on interactions. Empathy, which is composed of cognitive and affective aspects, can manifest itself in the interaction between students and staff. An interaction with empathy as a mediator factor can influence the motivation and academic performance of students [150]. The need for empathic interaction is especially evident in culturally diverse students on campus, as this affective component helps them adapt [143].

Several articles have analyzed the relationship between feelings and student engagement with their HEI. Kahu et al. have extensively studied the role of student engagement, regarding students' self-efficacy, emotions, belonging and well-being. In these studies, the importance of emotions as inhibitors of engagement and as outcomes has become evident, being a determining factor for academic success. An assertion is highlighted urging HEIs to recognize that each student journey is idiosyncratic [142, 146, 151, 153]. Cownie highlights the importance of the affective environment in student engagement. She recognized 3 factors that drive the student commitment which are: i) students' affective commitment towards academics, ii) students' calculative commitment towards the institution, and iii) commitment balance, which contemplates a reciprocal reaction by the HEIs regarding the student's commitment. In these factors the recognition of emotions between the interacting parties is vital [154].

It is important to observe how emotions impact on student's well-being is manifested from early stages of their interaction with the educational institutions, from their first-year transition to the final stages of their student life. Young et al. mention how negative emotions such as stress impact through and beyond HE studies, especially during the transition of fresh students [152]. Similarly, Parker mentions how emotions influence the late stages of the student's journey, reflecting on the students' professional identity [155]. In this way, it is evident how students' emotions cross the threshold of the classroom and manifest in aspects of their daily life, before and after interacting with HEI.

9.3.3. RQ3: What Methods are Used to Evaluate Emotions in Student eXperience?

As mentioned, when answering the first research question, a large number of articles use self-reported methods (mainly interviews, questionnaires, and surveys) to find out about students' experiences. In the articles analyzed, however, variations could be observed in the processing and postprocessing mechanisms of the reported data.

It is of special interest an article by Tzacheva et al. which used text mining to process the feedback provided by students, to detect and analyze emotions, in order to identify the impact of active learning methods [147]. This process used the sentiment dictionary Multi-Perspective Question Answering (MPQA) [141]. The authors highlight how negative emotions are one of the main reasons for students to drop out their studies in HEIs. In articles referring to the interaction of students with educational services, quality questionnaires are used to analyze the experience of students. Tan et al. are using the general, well-known SERVQUAL scale [150]. This can be a problem if we consider that the SERVQUAL dimensional instability has been reported [156, 157, 158].

9.4. Discussion About Emotions in Student eXperience

The importance of analyzing emotions throughout all stages of the student experience is evident, given the significant roles that emotions play in educational settings. Emotions can function as inhibitors or enhancers of student engagement, either impeding or fostering active participation in learning activities. They act as agents that can enhance or diminish motivation and attention, directly influencing students' ability to concentrate and persist in academic tasks. Furthermore, emotions facilitate empathic communication between individuals, improving the quality of interactions among students and between students and educators. All of these emotional roles have a demonstrable impact on academic outcomes and student well-being, affecting not only academic performance but also overall satisfaction and mental health.

Despite the clear significance of emotions in education, there is a notable lack of scholarly articles that analyze the impact of emotions on the SX from a CX perspective. This gap in the literature does not preclude the identification of CX-related factors in the studies we have analyzed. For instance, factors such as physical and emotional interactions between students and various actors within the academic environment are evident. These interactions occur directly between individuals and services—such as student support services, faculty-student interactions, and peer collaborations—or indirectly through educational materials, including textbooks and digital resources with graphical content. These elements are crucial in shaping the overall student experience, influencing how students perceive and engage with their educational environment. Moreover, it is observed that researchers commonly rely on self-reported methods, such as questionnaires and interviews, to collect information regarding students' emotional experiences. While these methods provide valuable insights, they can present challenges given the extended duration and unique characteristics of the student journey. The student experience is a dynamic process that unfolds over time, with emotions fluctuating in response to various academic and social stimuli. Relying solely on end-point evaluations may not capture the nuanced temporal evolution of students' emotional states.

For this reason, we propose that it is more appropriate to analyze the temporal evolution of emotional impacts throughout the student's journey, rather than conducting evaluations exclusively at the conclusion of their studies. By adopting a longitudinal approach, we can monitor changes in emotions at different stages, such as during the transition into university life, throughout coursework, during assessments, and as students prepare to graduate. This method allows for a more comprehensive understanding of how emotions influence the student experience over time, enabling educators and institutions to implement timely interventions that enhance student engagement, motivation, and overall well-being.

10. Culture and Student eXperience

As part of the work carried out during the third semester of the doctoral program, an analysis was carried out on the relationship of cultural aspects with SX [159]. The importance of this work with respect to our proposal lies in the preliminary analysis that is carried out relating cultural aspects with respect to the SX dimensions, and delving into the role that these cultural aspects have in the use of technological devices.

As a preliminary work that relates cultural aspects with SX, this work provided an insight on the impact of cultural factors for students, the most common cultural models, and the adaptation of technological solutions based on cultural aspects. The importance of culture in communicative processes and its transversal relationship with all SX dimensions is highlighted. The results of this work are detailed in this section.

10.1. The Role of Culture in Student eXperience

The importance of cultural aspects for students is undeniable. This is not only for the academic field. Even so, the impact that cultural factors have on the lives of exchange or immigrant students may have an impact on their learning outcome and affective states. Todd (1994) pointed out some factors that can influence the integration or segregation of culturally dissimilar populations. In this way, elements such as the structures of family nuclei in the host country have a high impact on cultural assimilation [160]. This is an important aspect when proposing solutions with a cultural approach. Evidently it is almost impossible to propose a SX model that manages to correct all the problems of students caused by cultural asymmetries.

Another limitation of our research, closely related to the previously mentioned point, lies within the social dimension of the SX. It is not feasible to comprehensively explore the ways in which students' satisfaction with a social, spontaneous, and personal process can be effectively enhanced. Despite this limitation, it is important to acknowledge that this does not diminish the significant role that modern technologies play in facilitating and enabling social interactions among students. These technologies have become indispensable tools for fostering communication, collaboration, and community-building within the academic environment, thereby contributing to the overall student experience.

It is possible to contribute to the development of an SX model based on cultural related works. These works provide valuable information on the culture-communication relationship [161], culture-perception, and culture-education, among others.

10.2. Culture and Communication

When we refer to culture and communication, it is common to talk about intercultural and cross-cultural communication. Although some scholars mention that intercultural communication is one form of cross-cultural communication, others defend that those are two completely different concepts. Gudykunst defines cross-cultural communication as the comparison of communication across cultures. Also, defines intercultural communication as the communication between people from different cultures [162]. In this way, in order to correctly analyze intercultural communication, it is necessary to understand cross-cultural communication. For his part, Ma (2004) in his work extends Wittgenstein's language-game of the builders. As a result of this work, she concludes that intercultural and cross-cultural communication are not far from each other concepts [163].

The relationship between communication and culture can be seen in technological solutions. Rau et al. (2009) investigated the effects of culture and the communication styles in relation to people's acceptance of the recommendations given by robots. Their results indicated a clear difference between groups of people, attributed to cultural differences regarding their language. This certainly shows the importance of culture in HCI solutions; in the digital age the way in which information is presented has a great impact on users [164]. We consider language a crucial element when developing an SX model taking into consideration that communication between subjects is carried out across all SX dimensions.

A remarkable element in terms of the cultural differences between subjects are the communicational contexts [165]. According to Dozier et al. (1998) communication context refers to "(...) the environment and circumstances surrounding the message itself, including history, knowledge, use of pauses and silences, assumptions about the other person's values, and so forth" [166]. In this way, cultures can be differentiated in terms of high or low context depending on the economy and dynamics of their language [167]. The SX personal dimension includes the students' relationship with their environment. With this information, the development of an efficient SX model must take inherent aspects of the communicational context into consideration. This is evident considering that students relate to their HEIs not only through their courses, but using support services, library, financial services, among others.

10.3. Culture and Perception

In view of a series of research based on the Hofstede works it is evident that cultural aspects have an impact on users' perception about technology, innovation adoption and use. Additionally, for the purposes of these articles, particular models have been used to relate technology systems/products attributes with the perception of the users. Hassan and Wood (2020) have investigated the influence of country culture in relation to the adoption of mobile banking systems. For this they focused on users from Egyptian and US cultures [168].

In their study is of special interest the use of the Technology Acceptance Model (TAM) [169] to analyze the technology innovation adoption and use of the users under analysis. Their results show that the country's culture may influence user perceptions toward usage of innovative technological products or services. Similarly, Mohammed and Tejay (2017) analyzed the impact of users' perceptions and concerns in relation to e-commerce services, this with respect to culture [170]. In this work, the impact of cultural factors regarding the adoption of e-commerce technology is evidenced.

It is important to mention that based on what was stated by Parasuraman et al. (1985) [171] the perceived quality of a service or a product can be explained with the relationship between users' expectations and perceptions. In view of the clear relationship that exists between the culture of a certain user and their perception of a technological product or service, it is clear that cultural aspects could determine the perceived quality.

10.4. Culture and Education

The impact of cultural aspects related to technology in education can be evidenced in a wide range of studies. This can be observed in the literature, especially in articles referring to e-learning, distance learning, and mobile learning [172], and the role of cultural aspects in the adoption of technology. In this way, technology as a tool can help in educational processes, and cultural aspects determine the degree to which students are able to take advantage of such technology and adopt/accept it [168].

Although most of the research on technology and culture uses the cultural dimensions proposed by Hofstede, some researchers have added additional factors. Hamidi and Chavoshi (2018), for example, have proposed the factor "culture of using applications" or "culture of using" in their study [173]. This concept refers to the cultural elements that facilitate or hinder the mobile learning of students. This shows how theoretical models regarding culture and technology scale as technology advances.

It is evident in view of the existence of the educational dimension of SX [20] that the analysis of the culture-technology-education relationship is imperative to develop a holistic SX model.

10.5. Discussion About Culture in Student eXperience

The SX dimensions are made up of the social, educational, and personal dimensions. The development of solutions regarding the social dimension should be explored further. This considers the ubiquity, variety and particularity of social interactions, which vary from student to student. Having clarified this, we will analyze the opportunities to improve the SX by analyzing the case of each dimension.

We believe that's great potential in analyzing the educational dimension. This takes the variety of technological solutions that facilitate and/or allow education into consideration. The efficient use and adoption of technology, we know, depends partially on cultural aspects. The use of technology can enable the education of students with highly limited physical disabilities or students in remote areas. Additionally, the design and language used in educational applications and platforms certainly influence student satisfaction.

The personal dimension is where the student's culture is explicitly manifested. This dimension lies in the student-environment relationship, student emotions and student identity. The development of solutions in this dimension may include the use of affective computing and non-invasive environment interventions. One way to improve the student experience, considering their cultural background, is the use of cross-cultural design in terms of developing solutions for students.

Communication is a widely explored element in terms of user culture [164,165,166]. This is an important element to develop solutions for students, since it is evident that communication is present transversely in the 3 dimensions of the SX. We find it necessary when developing an effective SX model to consider the importance of the form and medium through which students communicate. It is important to mention that the average student communicates throughout their student period with teachers, classmates, technical personnel, educational and support services, and digital applications, among others.

We found it feasible to use widely used and validated cultural dimensions, such as the Hofstede's model, as a basis for including cultural aspects to our SX model. The extension of the model will be done considering the special characteristics of the student as a consumer, such as special needs, spaces for interaction, and common communication channels.

11. Proposing a Student eXperience Model with Cultural Factors

As an essential stage of our proposal to develop a methodology that allows evaluating the SX in a holistic way is the analysis of the cultural dimensions. This work was documented in an article published in 2023 titled "Proposing a Student eXperience Model with Cultural Factors", and served to formalize the evaluation methodology [174]. For these purposes we mainly use Hofstede's national culture dimensions. Hofstede's national culture dimensions were developed in 1980 from the results of a large perception survey of workers in IBM offices, conducted between the 1960s and 1970s. The results of the surveys were subjected to statistical factor analysis by Hofstede, who was able to establish causal relationships between the behaviors and perceptions of people belonging to specific national cultures, defining 4 initial national culture dimensions. In 1991 Chinese sociologists conducted a cultural study that established a national culture dimension referring to the long/short term orientation of individuals in a society [175]. Hofstede included this dimension in his model later [176]. The addition of the sixth national culture dimension, referring to indulgence and restraint, and the verification of the previous five dimensions was carried out after Minkov's studies on the data from the World Values Survey [177].

The choice of Hofstede's cultural model is because it has been widely validated after multiple practical applications. Additionally, this model has incorporated more dimensional elements over time [14] and the dimensions of other cultural models have a direct (correlational) relationship with the dimensions proposed by Hofstede [178-181]. In this regard we should point out that the focus on a specific cultural model is not a problem. This is because existing cultural models often share common elements. In this way, culture is usually analyzed as a multilevel and multidimensional phenomenon. Furthermore, in cultural models it is generally agreed that culture refers to a set of stable values widely diffused in a society over a relatively long time [18, 181].

We point out that CX/UX solutions that incorporate cultural factors are not something new [182]. The positive results in the industry when considering cultural elements in solutions have been an incentive to develop an SX model that includes cultural dimensions. Table 15. details the six national culture dimensions proposed by Hofstede and their respective abbreviations.

Abbreviation	Cultural Dimension	Description
PD	Power Distance	PD refers to the human inequality problem. This element determines people's acceptance degree to submit to the orders of an entity or individual in a hierarchical system. This applies both in society and in institutions.
IDV	Individualism vs. Collectivism	IDV dimension refers to the individuals' degree (and predisposition) in a society to integrate into primary groups. In addition, this element determines group or individual thinking.
MAS	Masculinity vs. Femininity	MAS dimension refers to men and women's emotional roles in society (and institutions). This element is related to individuals' assertiveness, apart from his sexuality.
UA	Uncertainty Avoidance	UA dimension refers to the stress level perceived by individuals in a society as a function of an uncertain future. This element determines the degree of risk that individuals are willing to accept in societies and institutions.
LTO	Long-Term Orientation vs. Short-Term Orientation	LTO dimension refers to the focus of the people's efforts. In this way, it is analyzed if people in a society are focused on the past, the present, or the future, and if they seek rewards in the short, medium, or long term.
IVR	Indulgence vs. Restraint	IVR dimension refers to people relationship between control-gratification and their desires. This element is related to enjoying life and the moral perception of leisure in society.

Table 15. Hofstede's National Culture Dimensions [14].

The use of the Hofstede model has the advantage of having several investigations associated with the educational field that can help complement our proposal. Some examples of this are a study that relates the Hofstede dimensions of LTO and IVR with the academic performance of students [183]; a study that analyzes the LTO, IDV, and UA with respect to teaching methodologies [184]; a study that relates the cultural dimensions of Hofstede with respect to online learning [185]; or a study that analyzes the dimensions of UA and PD regarding the student learning process [186].

The SX cultural aspects identification allow us to analyze the satisfaction or dissatisfaction degree that students experience throughout their university life. In simple terms, studying the cultural factors involved in students' interactions with HEIs gives us important insights on how we can improve their holistic experience. This is ideally framed in an SX evaluation process.

11.1. Analysis of Cultural Aspects in the SX dimensions

The development of a SX-Cultural model presupposes a factor-by-factor analysis of the elements that make up the cultural [14] and SX [20] models. We have analyzed the relationship of people in a society regarding some culturally diverse topics such as general norms, gender, and family. We have related these topics to SX dimensions that can be influenced by them (Tables 16., 17., 18., 19., and 20.). For this we have been guided by the elements identified by Hofstede referring to each national culture dimension and the factors that make up each SX dimension.

After this analysis we have developed a matrix that allows us to see the relationship between cultural aspects and SX dimensions (Figure 7.). With the matrix it is clear what SX factors are influenced by specific cultural elements. This matrix is finally used to integrate the cultural aspects to a new SX model.

11.2. About Power Distance (PD) and Student eXperience

Hofstede defines Power Distance (PD) as “the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally” [14]. Within his conception of an institution, as basic elements within a society, he encompasses schools. By extension of the concept, the Power Distance can be evidenced in HEI, such as universities and colleges. This concept is related to the subjects' perception of an authority figure. The subjects in an organization can perceive paternalistic or autocratic treatment, to a greater or lesser extent. The relationship between subjects of different levels of authority is related to the dependency between people. Additionally, the emotional distance between subjects determines the degree of communication. This is because the degree of fear of the subordinates defines the ease of approaching and contradicting their authorities directly.

The Power Distance Index (PDI) indicates the degree of dependency of subjects under an authority figure in an organization/institution in a given country. Assuming the foreign origin of a certain student to a country with a PDI score very different from that of the country of residence, there could be cases of culture shock. Consequently, in cases of culture shock, a state of anxiety or discomfort could be generated that could affect the perceived quality and satisfaction with respect to the services provided by an HEI.

Within an HEI, there may be student-teacher or student-administrative relationships. This considering the hierarchical structure of the institutions and the services they provide. Considering the aforementioned, we believe that the Power Distance is mainly related to the Institutional Engagement in the social dimension of the SX; with the relationship of the students with the Educational/Support Services in the educational dimension; and with the Student Feelings and Emotions, and Student Development and Outcomes in the personal dimension. To a lesser extent, the distance to power could be evidenced in the student's Community Relationship, in the social dimension, and in the environmental aspects in the educational and personal dimension, in situations in which they interact with subjects in a high position in the HEI.

Studies related to Power distance have been conducted on subjects not necessarily directly involved in business settings. This includes the use of students as test subjects [178]. It has been observed that students scoring high on power distance tend to have thoughts related to “Having few desires”, “Moderation, following the middle way”, and “Keeping oneself disinterested and pure”. Students in countries scoring low on power distance tend to have thoughts related to “Adaptability” and “Prudence”. It is important to mention that it has been observed that student power distance affects classroom activity and interaction [187]. In this way, the importance of analyzing this cultural dimension is evident when developing solutions that aim to improve the SX.

Table 16., built from the empirical analysis of the PD elements [14], relates the general norm, family, school, and health care values with the factors that make up the SX dimensions [20].

POWER DISTANCE: General Norm, Family, School, and Health Care		
POWER DISTANCE ASPECT	**RELATED SX DIMENSION**	**COMMENT**
Attitude towards people's Inequalities	Community Relationship, Educational/Support Services, Student Feelings and Emotions, Environment Relationship	The relationship lies in how people approach relationships of equality or inequality in interpersonal treatment (asymmetric) can explain the communicative dynamics student-student, student-professor, student-official, in addition to the communicative output
How relationships should be handled	Community Relationship, Student Feelings and Emotions, Environment Relationship	The relationship lies in the way in which the subjects relate to each other in the non-strictly academic environment
On the relationship and dependence of more or less powerful people	Community Relationship, Student Feelings and Emotions, Environment Relationship, Educational/Support Services	The relationship lies in the adopted attitude in the student-student, student-teacher, and student-official relationships, depending on the perceived 'power'
On the relationship of obedience and respect between children-parents	Educational/Support Services, Institutional Engagement	The relationship lies in the obedience and respect that the students demand and have with the professors and HEI organisms. We believe that the student's obedience to the HEI contributes to their institutional engagement given the possible family source of financing for their studies
On the role of children in old-age parents security	Student Development and Outcomes	The relationship lies in the possible cultural/economic/personal motivation of the student or his/her family to invest in education
On equality relationships between students and teachers	Learning Engagement	The relationship lies in the educational commitment that the teacher can elicit from his/her students depending on the level of authority perceived by the students

About the teacher's initiative expectations from students	Student Development and Outcomes, Learning Engagement	The relationship lies in the student-teacher dynamic that determines the teaching style. This influences the skills developed and commitment by students
On the expected role of teachers when educating	Higher Education Quality, Learning Engagement	The relationship lies in the perceived quality of classes based on the expected role of teachers by students
On the factors that influence the quality of learning	Higher Education Quality	The relationship lies in who the students look at when determining the HE quality (themselves or the educators)
On authoritarian values in less or more educated persons	Educational/Support Services, Institutional Engagement	The relationship lies at the degree of authoritarian values that the more or less educated people show. This can influence the desired service level by students. In this way this can influence their institutional engagement
About the educational policy focus	Higher Education Quality, Student Development and Outcomes	The relationship lies in the educational policy focus (on secondary schools or universities). This can influence the HEI perceived quality by students

Table 16. General Norm, Family, School, and Health Care aspects of Power Distance on SX.

11.2.1. About Power Distance in Student eXperience Social Dimension

In the social SX dimension, the distance to power is evidenced mainly by institutional engagement. This is because student engagement is strongly linked to the degree of trust inspired by authority figures, such as teachers and high-ranking administrators. In this way, it will be more difficult for students to engage with HEIs if they perceive autocratic treatment towards them. This is especially important when we refer to students from countries with low PDI in countries that have a higher PDI score. Additionally, when students associate power distance with adaptability, this dimension is related to the Community Relationship aspect of the social dimension of SX. This is because the student's adaptation process takes place in part with respect to the university community.

11.2.2. About Power Distance in Student eXperience Educational Dimension

In the educational dimension of the SX, the distance to power is evident with respect to the Educational/Support Services. This is because students may perceive paternalistic treatment by student support services. This, depending on the cultural background of the students, can cause a negative reaction, in terms of emotions and satisfaction. Furthermore, in the words of Hofstede, “effective learning in such a system depends very much on whether the supposed two-way communication between students and teacher is, indeed, established”. The PD is also related to the perceived quality of education, since quality of learning, which is related to HE quality, is determined by the excellence of the students. This value is strongly associated with the PD values related to adaptability and desires.

11.2.3. About Power Distance in Student eXperience Personal Dimension

As PD is associated with the desire for progress within the institution, it is related to the "Student Development and Outcomes" aspect of the personal dimension of the SX. Additionally, like the desire for power in the social dimension, when students associate power distance with adaptability, this dimension is related to the Environment Relationship aspect but at a personal level, not strictly in an academic setting.

The PD is also related to the Student Feelings and Emotions of the SX personal dimension. This is because in one way or another, the feelings caused by an autocratic or paternalistic figure in their immediate environment (not necessarily academic) will have an impact on their state of mind and their expectations of their environment.

11.3. About Individualism/Collectivism (IDV) and Student eXperience

The dimension of individualism vs. collectivism (IDV) is defined based on the two central concepts: Individualism and Collectivism, which are polar opposites. Hofstede details that “Individualism pertains to societies in which the ties between individuals are loose: everyone is expected to look after him- or herself and his or her immediate family. Collectivism as its opposite pertains to societies in which people from birth onward are integrated into strong, cohesive in-groups, which throughout people's lifetime continue to protect them in exchange for unquestioning loyalty”. In this way, it is evident that this dimension is present in instances in which the student is part of or is affected by group processes. This occurs both in the classroom, when working on group projects; in relation to processes that require reaching consensus between students-teachers or students-educational authorities; or in processes of the student's personal life, contained in the personal dimension of the SX.

As a result of the individualist subjects data collected on the Hofstede study, he identified some work goals items. These are: (1) Personal time, which refers to having a job that leaves sufficient time for family life and leisure; (2) Freedom, which refers to having enough freedom to adopt a personal job approach; (3) Challenge, which refers to having challenging work and tasks to do, in which a sense of personal accomplishment could be achieved.

Regarding collectivist individuals, elements related to the following work goals were detected: (4) Training, which refers to have work training opportunities (to improve your skills or learn new skills); (5) Physical conditions, which refers to have good physical working conditions (good ventilation and lighting, adequate workspace, etc.); (6) Use of skills, which refers to fully using skills and abilities on the workplace. Although these data were originally collected from the opinions of IBM employees by Hofstede, later works in the field of culture have defined dimensions similar to those detected by Hofstede and with a high degree of correlation in their results [14].

As with the cultural dimension related to power distance, as a result of studies that replicated Hosftede's work with test subjects related to the academic world, phenomena that are directly related to the dimensions of the SX were detected. Students with a high index of individualism found the following values particularly important: (1) “Tolerance of others”, (2) “Harmony with others”, (3) “Non competitiveness”, (4) “A close, intimate friend”, (5) “Trustworthiness”, (6) “Contentedness with one's position in life”, (7) “Solidarity with others”, (8) and “Being conservative”. Regarding the students with a rather collectivist background, they found the following important values: (9) “Filial piety (obedience to parents, respect for parents, honoring of ancestors, financial support of parents)”, (10) “Chastity in women”, and (11) “Patriotism” [177]. Regardless of the pole to which these values belong (Individualism or Collectivism) they can be related to aspects of the SX dimensions. All of them are manifested directly or indirectly in situations of collective action.

For this reason, the cultural dimension related to collectivism vs. individualism is observed in the 'Community Relationship' in the Social dimension of the SX, in the Resources/Learning Environment' and 'Educational/Support Services' in the Educational dimension of the SX, and in 'Student Feelings and Emotions' and 'Student Thoughts, Identity and Background' in the personal dimension of the SX.

It is important to mention works that have analyzed the relationship of IDV and PD cultural dimensions in learning-specific contexts [188, 189]. In this way we can exemplify the impact of this cultural dimension in the SX Learning Environment dimension; HEIs should consider culturally foreign students who, based on their cultural background, prefer to study individually. Certainly, it would be unsatisfying for a student to feel compelled to change their study habits both inside and outside the classroom.

Table 17., built from the empirical analysis of the IDV elements [14], relates the general norm and family values with the factors that make up the SX dimensions [20].

Individualism/Collectivism: General Norm and Family		
IDV ASPECT	**RELATED SX DIMENSION**	**COMMENT**
About the family structure (nuclear or not)	Community Relationship, Student Feelings and Emotions, Learning Resources/Learning Environment	The relationship lies in how family relationships can influence or replicate in the non-strictly academic student's social environment
Children learn to think in terms of we or I	Community Relationship, Institutional, Engagement, Student Feelings and Emotions, Learning Resources/Learning Environment	The relationship lies in how the group thinking of students can influence their communicative dynamics inside and outside the classroom
On whom applies the same value standards (exclusionist/universalism)	Community Relationship, Student Feelings and Emotions	The relationship lies in how the students value standards can influence their communicative dynamics outside the classroom
Do students avoid direct confrontations?	Community Relationship, Educational/Support Services, Learning Resources/Learning Environment, Student Feelings and Emotions	The relationship lies in how the students' willingness to confrontation can influence their communicative dynamics inside and outside the classroom
Friendship is predetermined or voluntary?	Community Relationship, Student Feelings and Emotions	The relationship lies in how friendship relationships can influence students' communicative dynamics outside the classroom
Individual or collective ownership of resources	Community Relationship, Student Feelings and Emotions, Learning Resources/Learning Environment, Educational/Support Services	The relationship lies in how students' ownership ideals can influence their perception about learning resources and educational support services
Adult children live with their parents or leave the parental home?	Student Feelings and Emotions, Educational/Support Services	The relationship lies in how home formation can influence the financing of studies

Students have a High-context or Low-context communication?	Community Relationship, Learning Resources/Learning Environment, Student Feelings and Emotions	The relationship lies in how student's communicative context can influence their social dynamic inside and outside the classroom
Socialization in public places or at home?	Community Relationship, Student Feelings and Emotions, Learning Resources/Learning Environment	The relationship lies in how students' socialization places can influence their communicative dynamics inside and outside the classroom
Trespasses lead to shame and loss of face for society or guilt and loss of self-respect	Community Relationship, Student Feelings and Emotions, Learning Resources/Learning Environment, Student Thoughts	The relationship lies in how trespasses effects can shape social relations inside and outside the classroom
About the criteria for marriage partners (predetermined or not)	Community Relationship, Student Feelings and Emotions, Educational/Support Services	The relationship lies in how student marriage can influence the financing of studies and the student's social life
Influence on girls' beauty ideals (girlfriends or boys)	Community Relationship, Student Feelings and Emotions	The relationship lies in how the student's beauty ideals can influence their communicative dynamics outside the classroom

Table 17. General Norm and Family of Individualist/Collectivist societies on SX.

11.4. About Masculinity vs Femininity (MAS) and Student eXperience

According to Hofstede, the cultural dimension associated with masculinity vs. femininity (MAS) is related to the assertive behavior against the modest behavior of a subject. It should be noted that both 'masculine' and 'feminine' refer to social roles commonly associated with males and females, respectively. In this way, the masculine is associated with traits commonly observed in males such as assertiveness, competitiveness, and toughness. Regarding the feminine term, it is related to traits commonly observed in females such as caretaking, relationships concerns, and living environment concerns. In this way, and in the words of Hofstede, a society "is called masculine when emotional gender roles are clearly distinct: men are supposed to be assertive, tough, and focused on material success, whereas women are supposed to be more modest, tender, and concerned with the quality of life. A society is called feminine when emotional gender roles overlap: both men and women are supposed to be modest, tender, and concerned with the quality of life" [14].

Individuals identified with a masculine profile tend to seek 4 goals in organizations: (1) Increase their earnings, (2) Get recognition for doing a good job, (3) advancement in job positions, and (4) have challenging work to do. The fourth goal is associated with the IDV dimension. On the opposite side, individuals identified with a female profile tend to seek 4 goals in organizations: (5) have good relationships with direct superiors in work, (6) cooperation in workspace, (7) live in a desirable area with their family (8) having the security that will be able to work for their company as long as they want. As with the previously mentioned cultural dimensions, masculine and feminine qualities can be observed in the context of organizations and institutions of different kinds. It should be noted that the dimension of masculinity vs. femininity is very controversial, and many other cultural models have chosen to give it a more politically correct approach. A review of nineteen smaller replications of Hofstede's initial study confirms this [190]. Table 18., built from the empirical analysis of the MAS elements [14], relates the gender and sex values with the factors that make up the SX dimensions [20].

Masculinity/Femininity: Gender and Sex		
MAS ASPECT	**RELATED SX DIMENSION**	**COMMENT**
Opinion about being responsible, decisive, ambitious, caring, and gentle as a feminine/masculine quality	Community Relationship, Learning Resources/Learning Environment, Student Development and Outcomes, Student Feelings and Emotions, Environment Relationship	The relationship lies in the social consequences of being responsible, decisive, ambitious, caring, and gentle, and their impact on personal/academic development and interpersonal relationships inside and outside the classroom.
What implies women's liberation?	Student Development and Outcomes, Student Feelings and Emotions	The relationship lies in the impact that the notion of women's liberation has on academic self-demand and on the search for leadership spaces. In addition to the emotional impact of the student
Single standard (both sexes are subjects) or double standards	Community Relationship, Student Development and Outcomes, Environment Relationship, Student Feelings and Emotions	The relationship lies in the role that male and female students adopt when interacting with each other, in personal aspirations and in the emotional impact
About norms for showing male or female nudity	Community Relationship, Environment Relationship, Student Feelings and Emotions	The relationship lies in the social dynamics that the perception of nudity has for students, and the emotional impact

Explicit (or not) discussion of sex, and lesser o greater implicit erotic symbolism	Community Relationship, Environment Relationship, Student Feelings and Emotions	The relationship lies in the social dynamics that the eroticism perception has on students and its emotional impact
Is sex a way for two persons to relate or imply exploitation?	Community Relationship, Environment Relationship, Student Feelings and Emotions	The relationship lies in the couple dynamics of students and the emotional impact, with the corresponding social consequences
Sexual harassment is considered a big or minor issue in society?	Institutional Engagement, Educational/Support Services, Student Development and Outcomes, Student Feelings and Emotions, Environment Relationship	The relationship lies in the social dynamics that the perception of sexual harassment has for students, and the role that educational services and the HEI have to correct these acts
Homosexuality is considered a fact of life or a threat to society?	Community Relationship, Institutional Engagement, Educational/Support Services, Student Feelings and Emotions, Environment Relationship	The relationship lies in the social dynamics that the perception of homosexuality has for a student, and the role that educational services and the HEI have to remedy these acts

Table 18. Gender and Sex on SX

11.4.1. About Masculinity vs Femininity (MAS) and Student eXperience Social Dimension

The cultural dimension regarding the MAS is directly related to all the factors that make up the social dimension of the SX. That is, the community relationship and institutional engagement. This is mainly due to the goals sought by both parts of the MAS spectrum; the relationship with direct superiors (teachers for example) and cooperation in the classroom are easily related to the subject's predominantly femininity state.

11.4.2. About Masculinity vs Femininity (MAS) and Student eXperience Educational Dimension

Masculinity and femininity are mainly related to two SX dimensions: 'learning resources/environment' and HCI 'educational/support services'. Both, as with the social dimension, is due to the cooperation sought by people with a more feminine than masculine profile.

11.4.3. About Masculinity vs Femininity (MAS) and Student eXperience Personal Dimension

MAS cultural dimension is related to all the elements of the personal dimension of the SX. This includes the 'Student Thoughts, Identity and Background' factor, which intrinsically includes the students cultural and social background. The student development and outcomes, as a factor of SX, is related to masculine aspects. This in view of the desire for a challenging educational environment, desire for personal growth, and academic recognition. Students' emotions are directly related to students' assertive behavior and/or modest behavior. And the relationship with the environment, not necessarily educational, is conditioned to the two behaviors mentioned.

11.5. About Uncertainty Avoidance (UA) and Student eXperience

The fourth cultural dimension of Hofstede's model is related to the uncertainty avoidance (UA) of people in a society. He defines Uncertainty Avoidance as "the extent to which the members of a culture feel threatened by ambiguous or unknown situations". This dimension is related to the feeling of nervous stress, which can be associated with a need for written (and unwritten) rules that reduce ambiguity in a given context. The Uncertainty Avoidance Index (UAI) provides a value associated with the degree to which individuals perceive ambiguous or unknown situations. A UAI of 0 is related to the weakest uncertainty avoidance per country, to around 100 for the strongest.

It is important to analyze uncertainty avoidance in relation to students. Mainly because this cultural dimension is strongly linked to the feeling of anxiety and stress. This is evidenced by the correlation observed between Lynn's country anxiety scores and the UAI scores found by Hofstede [14, 191]. In addition, it was observed that in countries with weak UAI anxiety levels are relatively low. Otherwise in countries with strong UAI the level of stress experienced is high, which usually leads to adverse mood states and psychological problems such as anxiety and depression [192].

This cultural dimension transversally affects all the dimensions of the SX, because in any of them the students can feel threatened by ambiguous or unknown situations. Even so, Hofstede observed certain characteristics of this dimension in the educational environment. Although this was not observed in HEI, but in summer schools, it can be extended to this educational level. He observed that students from strong uncertainty avoidance countries expect their professors to be "experts who have all the answers". A relationship of UA was also observed with the clarity of the teachers when communicating, the approaches when evaluating the students, and the attribution of their own merit by the students. Ultimately, UA is present in all dimensions of the SX.

11.6. About Long-Term Orientation vs Short-Term Orientation (LTO) and Student eXperience

The dimensions defined by Hofstede include some that were not detected in his initial work. An example of this is the Long Term Orientation (LTO) dimension that originated from the contrast of its cultural dimensions with those obtained after the development of the Chinese Value Survey (CVS) [14]. As a result of the development of the CVS, 4 dimensions were detected, of which 3 had a correlative dimension in the proposed Hofstede model. The LTO dimension was included as the fifth cultural dimension of his model by Hofstede, considering it relevant and not correlating with the uncertainty avoidance dimension. In his formal definition he said that "long-term orientation stands for the fostering of virtues oriented toward future rewards in particular, perseverance and thrift. Its opposite pole, short-term orientation, stands for the fostering of virtues related to the past and present, in particular, respect for tradition, preservation of 'face', and fulfilling social obligations".

The LTO refers, like the aforementioned dimensions, to two opposite value poles. On the one hand we have the values (1) persistence/perseverance, (2) thrift, (3) ordering relationships by status and observing this order, and (4) having a sense of shame. At the opposite pole we have the values (5) reciprocation of greetings, favors, and gifts, (6) respect for tradition, (7) protecting one's "face", and (8) personal steadiness and stability. The value contrast between the opposite poles of LTO is important. For example, in countries with a low rate of LTO students attribute success and failure to luck, while those with a high rate of LTO students attribute success to effort and failure to lack of it.

In addition, talent in mathematics subjects has been associated with students from countries with a high LTO index and a talent for theoretical, abstract sciences in countries with a Short-Term Orientation or low LTO. As a result of points 3, 4, 5, 6, 7, and 8, the role of the LTO dimension with respect to the social factors of the SX dimensions is evident. This, both in the social interactions of the social dimension and in the personal dimension. As for points 1 and 2, these can be directly related to educational factors of the SX. For example, tolerance for failure (associated with university dropout), school performance, and self-improvement/enhancement are associated with the value of persistence/perseverance and this with the educational engagement of the educational dimension of the SX. While the mere fact of studying, of being considered by students as a long or short term investment, is associated with the value of thrift.

Table 19., built from the empirical analysis of the LTO elements [14], relates the general norm and family values with the factors that make up the SX dimensions [20].

Long-Term Orientation: General Norms and Family		
LTO ASPECT	**RELATED SX DIMENSION**	**COMMENT**
Social pressure toward spending money or thrift	Educational/Support Services, Student Development and Outcomes	The relationship lies in the student's need to obtain financial support due to their savings
Perseverance vs quick results	Student Development and Outcomes	The relationship lies in the student's perception of their academic progress
Concern with social obligations vs willingness to subordinate oneself for a purpose	Community Relationship, Learning Engagement, Environment Relationship	The relationship lies in the commitment that the student acquires with his environment and his HEI
Concern about one's face and sense of shame	Community Relationship, Environment Relationship	The relationship lies in the impact of the student's social dynamics as a consequence of his sense of shame
Respect for traditions or circumstances	Community Relationship, Environment Relationship	The relationship lies in the impact of the student's social dynamics as a consequence of the interaction with people with different traditions or in different circumstances
Concern with personal stability or personal adaptiveness	Community Relationship, Environment Relationship, Learning Engagement	The relationship lies in how stability or adaptability allow the student to adapt to their environment, and adapt to the rhythm of the HEI courses
Marriage as a moral arrangement or a pragmatic arrangement	Community Relationship, Educational/Support Services, Environment Relationship	The relationship lies in how the student's marriage can affect their social relations in HEIs, and how it can also affect their finances

Is living with in-laws normal or a source of trouble?	Educational/Support Services, Environment Relationship	The relationship lies in how living with in-laws can affect the students emotions, and also affect their finances
Did young women associate affection with a boyfriend or husband?	Community Relationship, Environment Relationship	The relationship lies in how female student affection an affect their social relations in HEIs
Humility is for men & women or women only	Community Relationship, Environment Relationship	The relationship lies in how student humility affects their social relations in HEIs and their social image
Old age is an unhappy period that starts late vs is a happy period that starts early	Student Development and Outcomes	The relationship lies in how the pressure of age motivates the student to study and obtain results sooner or later
Can preschool children be cared for by others (not their mothers)?	Community Relationship, Environment Relationship, Educational/Support Services	The relationship lies in how the family burden influences the relationship of students with their social environment, and what they expect from student support services
Children get gifts for fun & love vs for education & development	Learning Engagement	The relationship lies in how students have been conditioned to be motivated by educational elements in their lives

Table 19. General Norms and Family aspects of Long-Term Orientation societies on SX.

11.7. About Indulgence vs Restraint (IVR) and Student eXperience

Hofstede's sixth cultural dimension deal with the poles of indulgence versus restraint (IVR). This summarize the tendency of individuals in a society to have life control, the importance of leisure time, and happiness or Subjective Well-Being (SWB). Hofstede defines this dimension by saying that "Indulgence stands for a tendency to allow relatively free gratification of basic and natural human desires related to enjoying life and having fun. Its opposite pole, restraint, reflects a conviction that such gratification needs to be curbed and regulated by strict social norms".

The notable values of this dimension are, (1) higher percentages of very happy people in indulgent societies versus lower percentage of very happy people in restraint societies, (2) a perception of personal life control in indulgent societies versus a perception of helplessness in restraint societies, (3) higher importance of leisure in indulgent societies versus lower importance of leisure in restraint societies, (4) higher importance on having friends in indulgent societies versus lower importance on having friends in restraint societies, (5) more extroverted, optimistic personalities, and positive attitude in indulgent societies versus more neurotic personalities, pessimistic personalities, and cynicism in restraint societies, (6) likelihood to remember positive emotions in indulgent societies versus less likely to remember positive emotions in restraint societies, (7) less moral discipline in indulgent societies versus moral discipline in restraint societies, (8) thrift is not very important in indulgent societies versus thrift is very important in restraint societies, (9) indulgent societies are loose, while restraint societies are tight.

The values mentioned in points 1 to 6 and 8 are clearly associated with the SX personal dimension. This is due to the relationship they have with the personal lives of students, their way of relating beyond the academic field, and leisure activities. While points 7 and 9 are more conditioned to environments. Although these points are related to the personal SX dimension, they can be expanded to the other 2 dimensions of the SX. The value poles "less moral" & "loose" societies versus "moral" & "tight" societies can be applied to student-student, student-academician, student-educational service relationships.

Table 20., built from the empirical analysis of the IVR elements [14], relates the general norm, personal feelings, and health values with the factors that make up the SX dimensions [20].

Indulgence vs. Restraint: General Norm, Personal Feelings, and Health		
IVR ASPECT	**RELATED SX DIMENSION**	**COMMENT**
Percentages of very happy people	Community Relationship, Student Feelings and Emotions, Environment Relationship	The relationship lies in the social dynamics that provokes the student's emotional predisposition
There is a perception of personal life control or a perception of helplessness?	Educational/Support Services, Student Development and Outcomes, Student Feelings and Emotions	The relationship lies in the student's sense of personal progress and the susceptibility they have to request help from HEI support services based on their helplessness perception
Importance of leisure	Environment Relationship, Student Feelings and Emotions	The relationship lies in how leisure positively regulates the emotions of students and strengthens social ties
Importance of having friends	Environment Relationship, Student Feelings and Emotions	The relationship lies in how having friends positively regulates the emotions of students and strengthens social ties
Is thrift important?	Educational/Support Services, Student Development and Outcomes	The relationship lies in how savings can affect the students' academic progress and their relationship with the HEIs financial services
Loose or tight society	Environment Relationship, Student Feelings and Emotions	The relationship lies in society regulates the student's behavior, and how this affects the student emotionally
Likeliness to remember positive emotions	Environment Relationship, Student Feelings and Emotions	The relationship lies in the social dynamics that provokes the student's emotional predisposition
Degree of moral discipline	Environment Relationship, Student Feelings and Emotions	The relationship lies in how students behave, and how this affects the student emotionally

Positive attitude vs Cynicism	Student Development and Outcomes, Environment Relationship, Student Feelings and Emotions	The relationship lies in how a positive attitude fosters the development of academic skills, and how this affects the student emotionally
Extroverted personalities vs neurotic personalities	Environment Relationship, Student Feelings and Emotions	The relationship lies in the social dynamics that provokes the student's personality
Percentages of people who feel healthy	Educational/Support Services	The relationship lies in how the perception of the students' health motivates them to seek help from the HEI medical services
Optimism degree	Learning Engagement, Student Development and Outcomes, Student Feelings and Emotions	The relationship lies in how an optimistic attitude fosters the development of academic skills, compromises the student academically, and how this affects the student emotionally
Birth Rate in relation to family income	Educational/Support Services, Student Development and Outcomes	The relationship lies in how the family and financial burden affects the students' academic development, and its relationship with the HEIs financial/social services
Death rates from cardiovascular diseases	Educational/Support Services, Student Feelings and Emotions	The relationship lies in the student search for HEI medical services and his relationship with death

Table 20. General Norm, Personal Feelings, and Health aspects of Indulgence/Restraint societies on SX.

11.8. Student eXperience Model

The development of a SX model that incorporates cultural aspects consists of a 4-stage process: (i) the development of an SLR in order to know the different definitions of SX, the interest areas, the dimensions/factors/attributes that make up the SX, and the methods used to evaluate the SX; (ii) the identification of factors and dimensions of the national culture in the literature. These elements were contrasted with those found in stage i, referring to the SX dimensions; (iii) union of the factors and dimensions detected in the literature regarding the SX and the national culture; and (iv) the development of a model with the factors and attributes resulting from the union from stage iii. The model proposed in this stage can be refined based on the results of application of the proposed evaluation methods.

As a result of the fourth stage of the development process, a matrix was formulated that relates cultural and SX factors (Figure 7.). This matrix was formulated based on an empirical association between the attributes that Hofstede used to define each cultural dimension and the factors of each dimension of SX [14, 20], as can be seen in Section 4. This matrix reveals the SX factors that are involved in each cultural factor within the dimensions of Hofstede's cultural model. Figure 7 shows in coloured boxes the cultural dimensions that are affected by certain SX factors. While stripped boxes denote cultural dimensions that are not directly affected by factors from the SX dimensions.

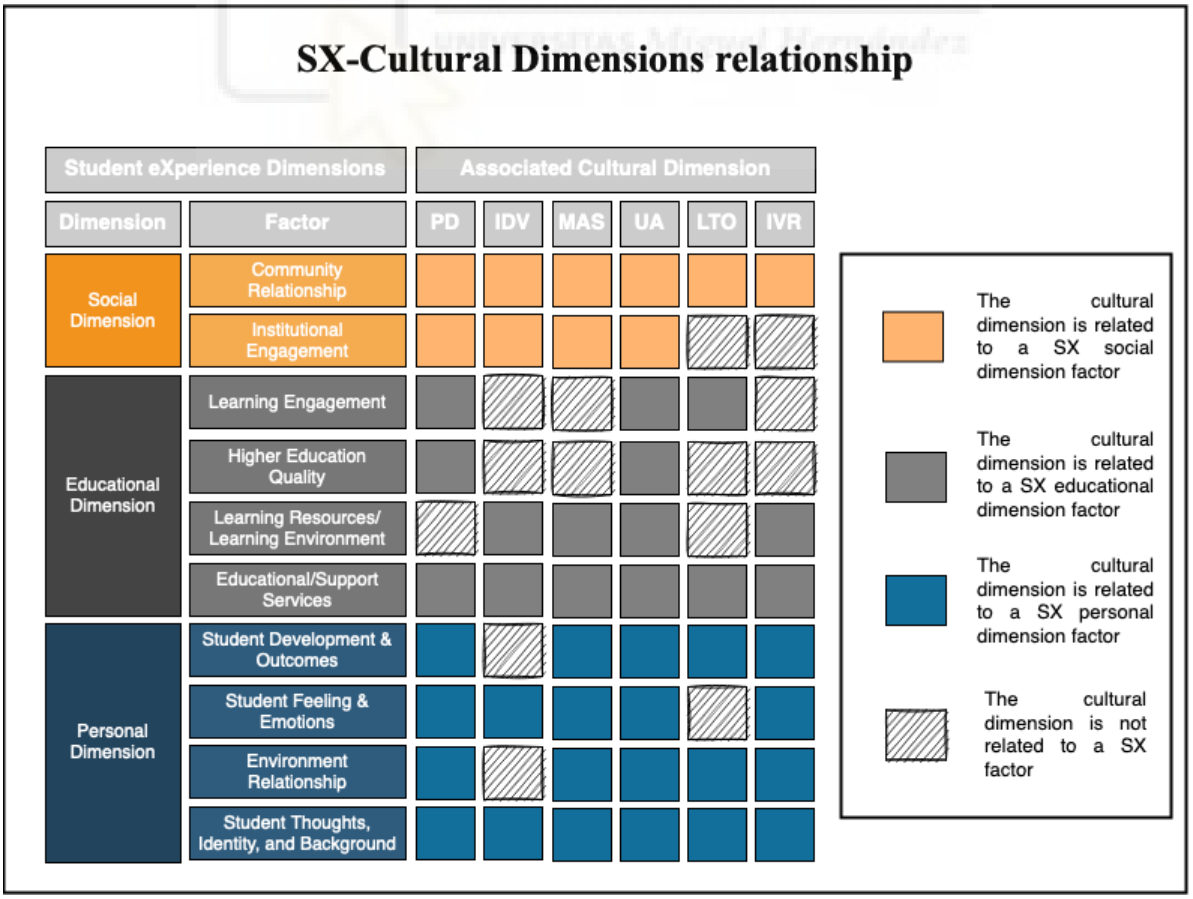

Figure 7. SX-Cultural Dimensions relationship.

The SX-Cultural matrix establishes a comprehensive relationship between cultural aspects and the SX at a conceptual level, drawing upon empirical literature and previously validated models (see Figure 7.). This matrix indicates that the factors constituting each cultural dimension can have a significant impact on specific elements within the SX model.

For example, when developing solutions related to the cultural dimension of Uncertainty Avoidance (UA), it is essential to consider that this will affect all components of the three SX dimensions: social, educational, and personal. Uncertainty Avoidance refers to the extent to which members of a culture feel uncomfortable with uncertainty and ambiguity. High levels of UA may lead students to prefer structured learning environments and clear guidelines, influencing various aspects of their overall experience.

Similarly, when working on solutions associated with the cultural dimension of Power Distance (PD), it is important to recognize that this has implications for elements related to the SX Educational Dimension, particularly those concerning the perceived quality of HEIs. Power Distance reflects the degree to which less powerful members of a society accept and expect that power is distributed unequally. In educational settings, a high PD may affect students' interactions with faculty and administration, impacting their perceptions of educational quality and satisfaction.

Table 21 presents the formalization of the SX dimensions, detailing the cultural aspects to consider in the analysis of SX factors. To achieve this, cultural factors were integrated into the description of each SX dimension. The inclusion of these cultural factors is derived from the relationships identified in the SX-Cultural dimensions relationship matrix.

By incorporating cultural aspects into the SX model, we create a more holistic framework that acknowledges the influence of cultural dimensions on the student experience. This integration allows for a more nuanced analysis of SX factors and supports the development of tailored solutions that address the specific needs and expectations of students from diverse cultural backgrounds.

SX Dimension	SX Factor	Description
Social Dimension	· Community Relationship · Institutional Engagement	The SX Social Dimension is related to the student's Community Relationship within the campus and Institutional Engagement. In this dimension, interpersonal relationships within HEIs (student-student) and interactions with staff (student-administrative and student-educator) are observed. Interpersonal relationships are strongly influenced by the cultural background of the participants, in terms of social hierarchy, institutional hierarchy, gender, ethnicity, and values. This dimension also shows the students' feeling of institutional-belonging/-commitment. This feeling is strongly influenced by some cultural factors by the students, such as sense of group belonging, student-student communication, shared values with the HEIs, and personal objectives and motivations.
Educational Dimension	· Learning Engagement · Higher Education Quality ·Learning Resources/Learning Environment ·Educational/Support Services	The SX Educational Dimension is related to Students' Learning Engagement, Higher Education Quality, Learning Resources/Learning Environment, and Educational/Support Services. In this dimension, the aspects involved in the development of an adequate educational environment are observed. Mechanisms focused on maximizing the educational results of students (teaching methodologies, technological infrastructure, educational support networks) are also contemplated. These aspects imply a positive perception of the quality of the HEI, for which reason quality has been incorporated into this dimension. Perceived quality depends on customer satisfaction, which is based on their perceptions and expectations [133]. In turn, perceptions and expectations are influenced by students' culture, especially cultural factors related to teacher-student communication, student goals, competitiveness, and long/short-term thinking.
Personal Dimension	· Student Development and Outcomes · Student Feelings and Emotions · Environment Relationship · Student Thoughts, Identity and Background	This dimension is related to Student Development and Outcomes, Student Feelings and Emotions, Environment Relationship, Student Thoughts, and students' Identity and Background. Personal aspects of each student's life that may influence interactions and perceptions with HEI services and products are considered. This dimension encompasses aspects directly related to culture, socioeconomic level, disabilities, personal aspirations, family structure, leisure, among others. This dimension is directly related to all the dimensions of Hofstede's model of national culture. This is because it is in the personal sphere of the student where they could manifest their cultural background in contexts-free social interaction.

Table 21. SX dimensions including cultural factors.

12. Towards Well-being and Inclusion in the Educational System: A Preliminary Methodology for Evaluating Student eXperience Considering Cultural Factors

In the absence of SX assessment methods that holistically encompass student experiences, we have set out to develop a SX assessment methodology that incorporates cultural elements. Although the cultural aspects are not the only ones that make up the SX, the rest of the aspects can be incorporated into the evaluation methodology based on the dimensions of the SX detected in the exploratory phase. The evaluation methodology design process was presented at the HCI International 2023 conference. This preliminary approach represents the first iteration of the evaluation methodology development process.

12.1. Student eXperience Evaluation Methodology Stages

We propose a 5-stage methodology to evaluate the SX. These stages are (1) pre-planning stage, (2) planning stage, (3) execution stage, (4) results analysis stage, and (5) result interpretation stage. The details of each one of these stages are found below and can be seen in Figure 8.

(1) **Pre-Planning Stage:** As an initial phase of the evaluation methodology there is a pre-planning stage, where information of interest is collected from the HEI (teaching evaluations, results of previous surveys, market studies), to develop a CJM of the students. Based on the results of the pre-planning phase, a special focus could be adopted on the methods of the execution stage, such as a focus on engagement or emotions. We insist on the importance of incorporating a student CJM as an input to the planning stage. If the HEI does not have one, one must be created.

(2) **Planning Stage:** This stage is focused on the selection of the participants of the execution stage and on the coordination of the methods to be used later. In this stage the participants are selected, ideally a significant number of them. Evaluators and guides should be selected based on their area of knowledge, as mentioned in the methods of section 12.2. of this document. It is important to choose a co-guide linked to the educational environment that assists the UX/CX expert in the execution stage. This is because it cannot be guaranteed that the UX/CX expert is an expert in the area of education. Furthermore, this provides diversity of opinion and would reduce the evaluation subjective burden.

(3) **Execution Stage:** In this stage, the methods described in section 12.2. are executed sequentially, as can be seen in Figure 8. The items contained in the checklists or surveys could be related to SX evaluation scales found in the SLR. This, in case a particular approach is required when evaluating the SX, such as a focus on engagement, emotions, or disabilities. The preliminary evaluation and the inspections are focused on the opinion of the HEI workers (educators, administrative staff, psychologists), while the final phase of the execution stage is focused on the opinion of the students. In this way, the opinion of the students and the providers/facilitators of educational services will be available. This would allow future development of solutions that improve SX without harming the technical feasibility of its implementations. We emphasize the importance of incorporating a co-guide linked to the educational environment that assists the UX/CX expert in the execution of the methods described in section 12.2. of this document.

(4) **Results Analysis Stage:** In this stage, the quantitative and qualitative results of the execution stage are analyzed. The qualitative data consist of the participants' subjective opinions, while the quantitative data is made up of Likert scale ratings from participants, and the subsequent statistical analysis of the results. The results data must be integrated, subjected to statistical analysis, and analyzed by experts. The analysis process needs to be complemented with graphical analysis tools, such as CJM and Emotional Journeys for each student profile detected.

(5) **Result Interpretation Stage:** This stage refers to the development of 2 graphical tools. The development of a CJM allows visualizing the "touchpoints" with which the student is related, that is, their interactions with the products, systems, and services that make up their student journey [13]. The incorporation of an emotional journey also allows the visualization of the fluctuation of the student's mood throughout their journey. These graphic elements should ideally coincide with the CJM developed at the beginning of the first stage, but delving into details.

It should be noted that the aforementioned model may undergo minor modifications throughout the postgraduate program. This includes the replacement, removal or addition of elements to the model presented in Figure 8.

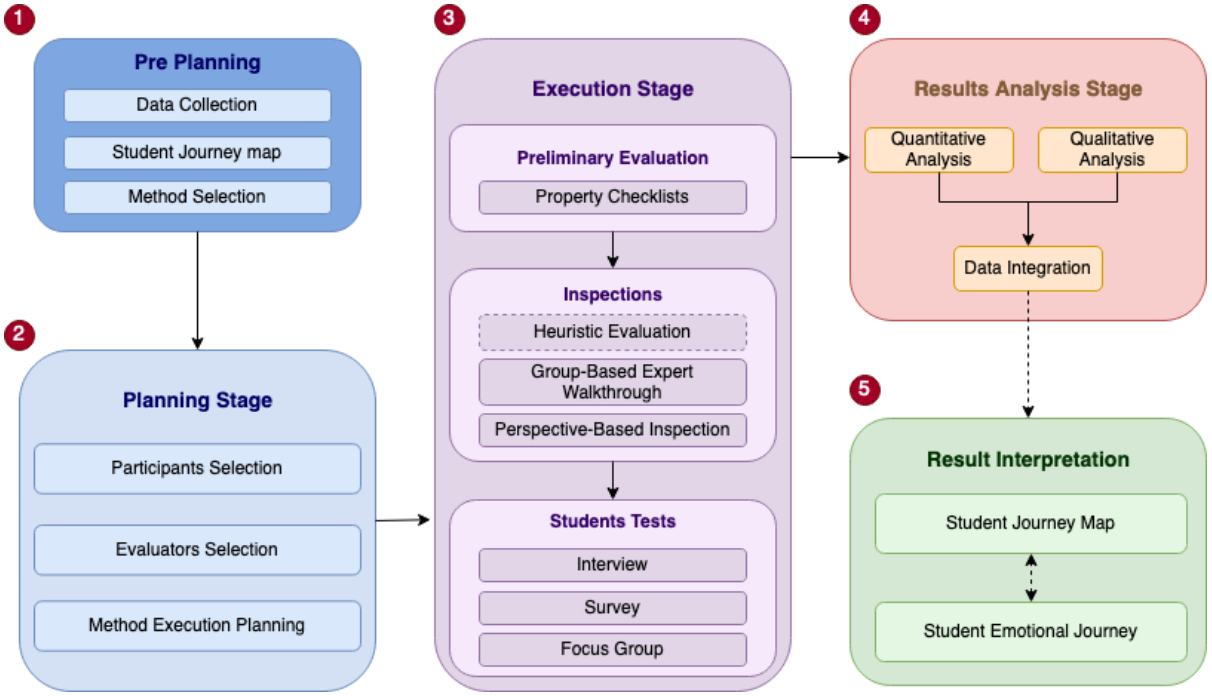

Figure 8. SX evaluation methodology stages.

12.2. Proposed Methods

Taking into account that SX is a particular case of CX and that this, in turn, extends the concept of UX, we consider it convenient to use UX evaluation methods to formulate our methodology. In addition, considering the information collected in the SLR, we believe that it is important to observe the elements commonly addressed in the evaluation tools to complement the aforementioned UX methods, obviously adapted to cover the student's journey from a CX perspective.

In this way we select widely used UX evaluation methods. These will be adapted to the particular case of the students, including the aspects contained in the SX dimensions and the tools detected in the SRL on the evaluation of the SX. Finally, to better analyze the results obtained, graphic methods of CX analysis applied to SX will be used, such as emotional maps and Customer Journey Maps (CJM) [13]. The UX evaluation methods to be used are mentioned below:

(1) **Property Checklist [193]**: This method consists of the application of a checklist associated with design properties. The objective is to see if the design objectives of a certain product are satisfied. In this method, an expert ux evaluator verifies that the elements associated with the checklist, such as low and high level properties, are met. The selection of this method lies in the possibility of associating certain items in the checklist with design objectives focused on student users with a specific cultural background.

(2) **Perspective-Based Inspection [194]**: This method allows an evaluator to perform usability inspections from different perspectives. In this way, usability issues are addressed by grouping them into one of several usability perspectives. The perspectives addressed must be mutually exclusive of each other. This inspection is done in several sessions. The selection of this method to incorporate it into our evaluation methodology proposal lies in the fact of the large number of "types of student" with different needs. Potential usability issues need to be addressed from the perspective of several types of learner.

(3) **Heuristic Evaluation [195]**: This inspection method allows evaluating software products based on observation and on a series of usability principles, called heuristics. It is carried out by groups of evaluators (between 3 to 5), who are in charge of detecting, classifying, and qualifying usability problems. We find it important to use this method in view of the existence of heuristics based on cultural factors, which may yield results of interest [182]. In addition, there are specialized heuristics for educational solutions which are related to the SX educational dimension [196].

(4) **Group-Based Expert Walkthrough [197]**: This method consists of a usability inspection carried out by expert evaluators in a domain. In our case, people related to the education sector. The inspection is supervised by a usability expert. The walkthrought consists of the fulfillment of predefined tasks by evaluators, under the supervision and guidance of the usability expert. Testers may not have previous experience performing usability inspections before. The results obtained in a primary phase of the walkthrough are noted down and subsequently discussed as a group. This method was included because it is important to have the opinions expressed in a group by people linked to the educational context. This taking into account that students may have cultural traits associated with societies that are more collectivist than individualistic.

(5) **Interview [198]:** Interviews are a qualitative research method. These are one-on-one talks between subjects for the purpose of obtaining information from a participant. Interviews allow open responses by the analyzed subject and can be of three types:

    (a) **Structured Interview:** It is a formal conversation where the questions and their order are predefined. In it, the interviewer guides the conversation. The data provided by this type of interview has a lower complexity of analysis than the other types.

    (b) **Non-Structured Interview:** It is a non-formal conversation, where the order and type of questions is not predetermined. In it, the interviewer is limited to orienting the topic of the conversation. They can yield very valuable information, but they take too much time to analyze.

(c) **Semi-Structured Interview:** It is a semi-formal conversation that combines predefined questions with questions that arise at the time, depending on the answers that the interviewee is giving. It is considered a hybrid between the structured and unstructured interview. Its difficulty of analysis is between the difficulty of the unstructured and the structured.

(6) **Survey [199]:** Survey is a statistical method of data collecting from individuals. Surveys are made up of physical or digital forms with questions limited to a specific number of predefined answers (closed question survey), questions with answers to the free choice of the respondent (open question survey) or mixed-response questions (closed and open questions). Researchers perform statistical surveys in order to make statistical inferences about a population under analysis.

(7) **Focus Group [200, 201]:** This qualitative technique is used to study the opinions and attitudes of a specific group of people about a product, system or service. This consists of organizing a group discussion session, with a moderator in charge of guiding the correct course of the session. The sessions address topics related to the expectations, opinions and needs of the participants with respect to the topic of interest.

As previously mentioned, the items in the written methods (checklists/surveys) and the tasks to be performed in the evaluations with test subjects (students) will be influenced by the aspects traditionally considered in the students' experiences evaluation scales, detected in the SLR. The final results should be used to develop a CJM for each student profile detected, and this profile may vary depending on cultural aspects, gender, disabilities, among others. It is recommended to complement the elaboration of the CJM with the integration of an emotional journey map of the students' experiences. This in view of the evidence that links SX with the students' emotions [5].

12.3. Preliminary Sampling

As preliminary work prior to the validation of the proposed instrument, an interview has been designed, which was applied in Chile and Spain. This preliminary survey was based on the NSS [130] and Hofstede's National Culture Dimensions applied to higher education. The preliminary survey consists of 31 items; 19 focus on the SX and 12 on cultural aspects of the student. Table 22 shows the questions in Spanish from the section focused on the SX. Table 23 shows the questions in Spanish from the section of the survey referring to cultural dimensions.

Item	Question
1	Los cursos desarrollados por los profesores son interesantes
2	Los cursos son exigentes y me desafían a dar lo mejor de mi
3	Mis cursos me ha brindado la oportunidad de explorar ideas o conceptos en profundidad
4	Mis cursos me han brindado oportunidades para aplicar lo que he aprendido
5	Las calificaciones y evaluaciones de los cursos han sido justas
6	He recibido comentarios útiles sobre mis trabajos
7	He podido contactar al personal de la universidad (profesores/técnicos/psicólogos/monitores/etc) cuando lo he necesitado
8	He recibido suficiente asesoramiento y orientación en relación con mis cursos
9	Los cursos están bien organizados y funcionan sin problemas
10	El horario de los cursos me resulta adecuado
11	Los recursos de TI y las instalaciones proporcionadas han apoyado durante mi aprendizaje
12	He podido acceder a recursos específicos (equipos, instalaciones, biblioteca, software, bases de datos, etc) cuando lo he necesitado
13	Me siento parte de una comunidad con el personal universitario y los estudiantes
14	He tenido las oportunidades adecuadas para trabajar con otros estudiantes como parte de mis cursos
15	He tenido las oportunidades adecuadas para proporcionar comentarios sobre mis cursos
16	El personal de la universidad valora los puntos de vista y las opiniones de los estudiantes
17	El asociación de estudiantes (delegación) representa efectivamente los intereses académicos de los estudiantes
18	En general estoy satisfecho/a con la calidad de los cursos
19	Sobre tu experiencia universitaria: ¿Hay algún aspecto particularmente positivo o negativo que te gustaría destacar?

Table 22. SX questions in the preliminary student survey (in spanish).

Item	Question
20	En general, los estudiantes tienen una visión optimista y positiva de la universidad y consideran que es posible divertirse allí
21	Tanto los profesores como los estudiantes aceptan con gusto las preguntas en clase y el ambiente es muy participativo y distendido
22	El sentimiento de competitividad individual entre los estudiantes es grande; los profesores no fomentan el trabajo en equipo
23	No hay sentido de identidad colectivo (clase o promoción): por ejemplo, a los estudiantes no les importa si los resultados de su clase son buenos o malos
24	Para los estudiantes la carrera es más importante que la familia o los amigos
25	La universidad apenas ofrece recursos para los estudiantes menos favorecidos; ni los estudiantes ni los profesores se preocupan por ellos
26	Los estudiantes saben exactamente cómo serán evaluados: se dispone de exámenes de otros años o información muy precisa sobre las evaluaciones
27	La burocracia es un gran problema para los profesores y también consume mucho tiempo de los estudiantes
28	En la mayoría de los cursos, gran parte del plan de estudios se dedica a contenidos de actualidad o futuro en ingeniería/ciencia/empresa, así como al futuro profesional de los alumnos
29	Cuando se trata de prepararse para tareas y exámenes, los estudiantes planifican desde el primer día y trabajan constantemente
30	Existen muy pocos e ineficaces mecanismos para que los estudiantes expresen su opinión e influyan en las decisiones de la universidad
31	El trato de los profesores es bastante distante. Se les considera una autoridad y rara vez se les cuestiona

Table 23. Cultural questions in the preliminary student survey (in spanish).

13. Evaluating the Student eXperience: A Scale that Includes Cultural Dimensions

As part of our evaluation methodology, we proposed the incorporation of our own tool. This tool is an evaluation scale. The scale is divided into two parts; The first part focuses on the aspects related to each of the dimensions of the SX of the model that we have proposed. The second part focuses on aspects related to cultural dimensions. The development and validation of this tool was documented in a conference paper. The information regarding said investigation is detailed below.

13.1. Developing a Scale for Student Experience Evaluation with Cultural Aspects

The conceptual analysis that we have previously carried out on SX, its dimensions and its evaluation methods allowed us to observe the lack of methods that incorporate cultural aspects [20]. Although there are evaluation scales that address cultural aspects, no integration with factors related to student interactions from a CX focus has been observed. Our scale is being developed considering several iterations:

1. A preliminary version of our scale was developed based on literature, adapting two tools already available. One focused on SX and the other on cultural aspects.
2. Our scale was evaluated by experts, academics, and undergraduate students.
3. The scale was refined based on their feedback.
4. The scale was validated through a pilot test.
5. The final version of the scale will be applied to undergraduate students from multiple cultural backgrounds and will be statistically validated.

Rodríguez-Rivero et al. (2007) proposed a scale in higher education environments, that includes questions based on the cultural dimensions proposed by Hofstede [202]. Based on the SX-cultural model [174] proposed by us, we selected and adapted questions to be applied in Latin America and Spain and included them in a section focused on cultural aspects of SX. Additionally, we included questions adapted from the National Student Survey (NSS) [22, 23] as well as an open question in the section focused on SX.

Our proposal grouped 31 questions and is focused on being a support method for the evaluation process of a broader methodology. We believe that with the perceptions provided by the students and with the observations of the HEIs staff it will be possible to suggest technically reliable improvements to increase student satisfaction considering their cultural background.

13.2. Preliminary Scale

We created the first version of our scale based on widely known student satisfaction surveys [130, 203] and a student survey with cultural background applied in Spain and Latin America [202]. The questions were adapted to Spanish to apply to the countries under analysis. The scale was divided into two parts. The first included 19 items grouped in the 3 SX dimensions: i) Social, ii) Educational, and iii) Personal. Item 19 is an open question so it was not included in the statistical analysis.

The second part included 12 items, grouped in the 6 National Culture dimensions proposed by Hofstede (2 items per dimension): i) Indulgence vs Restraint (IVR), ii) Individualism vs Collectivism (IDV), iii) Masculinity vs Femininity (MAS), iv) Uncertainty Avoidance (UA), v) Long-Term Orientation vs. Short-Term Orientation Term Orientation (LTO), and vi) Power Distance (PD).

The scale development was supervised by three UX/CX experts with computer science and statistics backgrounds, and items were refined based on their feedback. The demographic data included in the survey had questions regarding age, nationality, gender, promotion, and career.

This version of the scale was applied to a group of 31 undergraduate students from Chile and 38 undergraduate students from Spain. It should be noted that in the group of students from Spain there were students who identified with various nationalities, such as Argentina, Belarus, Bulgaria, Chile, Spain, France, Mexico, Romania, and Uruguay. The scale reliability for each model (SX/Culture) were analyzed with Cronbach's Alpha [204] (Table 24). After analyzing the UX/CX experts' group, the survey was proposed to undergo another expert judgment in a second iteration.

Model	Cronbach's Alpha
SX	0.887
Cultural	0.711
Cronbach Alpha's acceptable range	> 0.700

Table 24. Cronbach's Alpha test for data collected in the pilot scale.

Based on the reliability of the results (Table 24. and Table 25.), we adapted items IDV22, IDV23, MAS25, UA27, PD30, and PD31 from the cultural section. It was decided to reformulate the item questions to avoid inverted scale elements that could confuse the test subjects.

Subsequently, during the refinement stage of our study, it was determined that item MAS24 required additional reformulation. This decision was based on a thorough analysis of the Cronbach's Alpha coefficient, which indicated potential issues with internal consistency related to this item. Furthermore, feedback from subject-matter experts highlighted concerns about the clarity and relevance of item MAS24. Taking both the statistical findings and expert insights into consideration, we decided to revise item MAS24 to enhance its reliability and validity within the assessment instrument. This refinement aimed to improve the overall quality of the measurement tool by ensuring that all items accurately and consistently capture the constructs under investigation.

Model	Dimension	Item	Cronbach's Alpha eliminating item
SX	Educational	ED01	0.879
		ED02	0.885
		ED03	0.885
		ED04	0.878
		ED05	0.879
		ED06	0.874
		ED07	**0.897**
		ED08	0.881
		ED09	0.883
	Social	SO10	0.880
		S011	0.881
		SO12	0.880
		SO13	0.880
		SO14	0.877
		SO15	0.876
		SO16	0.884
	Personal	PE17	0.886
		PE18	0.874
Cultural	IVR	IVR20	0.672
		IVR21	0.657
	IDV	IDV22 [a]	0.697
		IDV23 [a]	0.710
	MAS	**MAS24**	**0.753**
		MAS25 [a]	0.685
	UA	UA26	0.689
		UA27 [a]	0.680
	LTO	LTO28	0.697
		LTO29	0.705
	PD	PD30 [a]	0.663
		PD31 [a]	0.683
[a] inverted scale element			

Table 25. Cronbach's Alpha test for data for each item.

13.3. Refining the Scale Based on Experts' Feedback

After developing the first version of the scale and with the supervisors' approval, we set out to refine the instrument through expert judgment. The scale was quantitatively and qualitatively examined in mid and late 2023 by:

- Four usability experts who work in the academic and private sectors.
- Eight academics from Chile, Colombia, and Italy.

The participants were asked to evaluate each of the 31 items using a 5-point Likert scale [205], where 1 is not appropriate and 5 is very appropriate. They were also asked to comment on items and the scale (Table 26.).

	Min	Max	Average	S.D.
Experts	2	5	4.54	0.76
Academics	1	5	4.46	0.93

Table 26. Overall opinions on the preliminary scale.

Based on the analysis of Cronbach's Alpha by dimensions and the comments of experts and academics, we decided to modify two items (Table 27.). The item MAS24 "For students, their university career is more important than their social circle" was selected to be adapted because the experts mentioned that the item can be ambiguous and difficult to interpret.

Another item identified for adaptation is LTO29, which states: "When it comes to preparing for assessments, students plan from day one." Similar to the previously discussed item, this statement was considered ambiguous regarding what students perceive as "day one." The phrase could be interpreted differently by each student—some may consider "day one" as the first day of the academic term, while others might view it as the day an assessment is announced. This variability can lead to inconsistent responses and affect the reliability of the data collected. Additionally, the item was criticized for its subjectivity. It is unclear whether respondents are expected to reflect on their personal study habits or comment on the general behavior observed among their peers. This lack of specificity may result in students providing answers based on different frames of reference, further compromising the validity of the responses. To address these concerns, it was decided during the refinement stage to reformulate item LTO29, incorporating feedback from experts and considering Cronbach's Alpha values to enhance the clarity and effectiveness of the assessment tool.

Model	Dimension	Item	AVG	SD	Action
Student eXperience Model	**Educational Dimension**	ED 01: The courses developed by the teachers are interesting	4.42	0.79	Keep
		ED 02: The courses challenge me to give my best by being demanding	4.50	0.67	Keep
		ED 03: My courses have given me the opportunity to explore ideas or concepts in depth.	4.83	0.39	Keep
		ED 04: My courses have given me opportunities to apply what I have learned	4.75	0.62	Keep
		ED 05: Course evaluations have been fair	4.50	0.80	Keep
		ED 06: Courses are organized in a way that they run smoothly	4.50	0.67	Keep
		ED 07: The course schedule is appropriate for me	4.08	1.08	Keep
		ED 08: The university resources and facilities have helped me in my learning	4.17	0.94	Keep
		ED 09: I have been able to access specific resources and facilities when I needed them	4.33	1.07	Keep
	9 ED Items				
	Social Dimension	SO 10: I have received useful comments on my academic work	4.33	1.23	Keep
		SO 11: I have been able to contact university staff when I needed it	4.75	0.62	Keep
		SO 12: I have received sufficient guidance regarding my courses	4.75	0.62	Keep
		SO 13: I feel part of a university community	4.75	0.62	Keep
		SO 14: I have had adequate opportunities to work with other students as part of my courses	4.58	0.51	Keep
		SO 15: University staff value student opinions	4.42	0.90	Keep
		SO 16: The student center/delegation/association effectively represents the academic interests of students	4.58	0.90	Keep
	7 SO Items				

	Personal Dimension	PE 17: I have had adequate opportunities to provide feedback on my courses	4.67	0.49	Keep
		PE 18: I am satisfied with the quality of my courses	4.83	0.39	Keep
	2 PE Items				
Hofstede National Culture Dimension	**IVR**	IVR 20: Students have a positive view of the university, considering that it is possible to have fun there	4.42	0.79	Keep
		IVR 21: Both teachers and students gladly accept questions in class, fostering a participatory environment	4.75	0.87	Keep
	IDV	IDV 22: The feeling of individual competitiveness among students is low; teachers encourage teamwork	4.27	1.27	Keep
		IDV 23: There is a sense of collective identity; students care about overall course assessment results	4.25	1.22	Keep
	MAS	**MAS 24: For students, their university career is more important than their social circle**	**3.75**	**1.22**	**Adapt**
		MAS 25: The university offers resources for less fortunate students	4.83	0.39	Keep
	UA	UA 26: Students know exactly how they will be evaluated; They have exams from previous years or precise information about the evaluations	4.25	1.14	Keep
		UA 27: Bureaucracy at the university is a problem that consumes a lot of students' time	4.67	0.78	Keep
	LTO	LTO 28: Courses focus on the professional development of students based on current content in engineering/science/business	4.92	0.29	Keep
		LTO 29: When it comes to preparing for assessments, students plan from day one	**3.42**	**1.44**	**Adapt**
	PD	PD 30: There are mechanisms for students to express their opinion and influence university decisions	4.58	0.79	Keep
		PD 31: The treatment of the teachers is quite distant. They are considered an unquestionable authority	4.45	0.69	Keep
	2 Items per cultural nation dimension				

Table 27. Quantitative evaluation of the preliminary scale.

All items of the SX dimensions were kept. Although Cronbach's Alpha increases slightly when item ED07 is eliminated, expert opinion supports its existence. Regarding the items referring to the cultural dimensions, 2 previously mentioned elements (MAS24 and LTO29) were adapted based on expert comments, clarifying their meaning and/or better focusing to be less ambiguous for students.

As part of Hofstede's work on the dimensions of national culture, scores ranging from 0 to 100 were developed for each cultural dimension [206]. In this way, each country has a score for each culture dimension, which oscillates between 2 opposite attitudinal poles. Values below 50 are considered low and values above 50 are considered high in relation to the distinctive attributes of each cultural dimension. These scores were used to comparatively describe data from the culture section of our scale for the Chilean and Spanish student groups (Table 28.).

The data in the table are complemented by the data in Table 29., where the Mann-Whitney U test was applied to check the existence of significant differences [207]. This is in consideration of the ordinal nature of the results that make it necessary to use a non-parametric test. In this test a p-value of 0.05 was used as a decision rule.

Considering the low number of test subjects and the lower cultural homogeneity of the group of students from Spain the results could distort to a certain extent. This could certainly be a limitation of our pilot test. To reduce the heterogeneity of the data the results have been reduced to the two largest groups of each test (Chile and Spain). This is also considering that the cultural scores proposed by Hofstede were documented for individual nations, not regions.

Table 28. presents the averages of the items referring to cultural dimensions together with the cultural dimension scores presented by Hofstede, differentiated by the country where the results were collected.

Item	Country	AVG	SD	Hofstede's Cultural Score
IVR 20	**Chile**	**3.26**	**0.93**	**IVR: 68 (Chile) 44 (Spain)**
	Spain	**2.59**	**1.19**	
IVR 21	Chile	3.61	0.84	
	Spain	3.70	0.95	
IDV 22[a]	Chile	2.35	1.20	IDV: 49 (Chile) 67 (Spain)
	Spain	2.52	0.98	
IDV 23[a]	Chile	3.16	1.44	
	Spain	3.26	0.94	
MAS 24	**Chile**	**2.71**	**1.13**	**MAS: 28 (Chile) 42 (Spain)**
	Spain	**2.04**	**0.98**	
MAS 25[a]	Chile	2.81	1.11	
	Spain	2.41	1.15	
UA 26	Chile	3.03	1.05	UA: 86 (Chile) 86 (Spain)
	Spain	3.07	1.04	
UA 27[a]	Chile	3.48	0.93	
	Spain	3.30	1.10	
LTO 28	**Chile**	**3.52**	**0.96**	**LTO: 12 (Chile) 48 (Spain)**
	Spain	**2.89**	**1.25**	
LTO 29	Chile	2.74	1.06	
	Spain	2.56	0.93	
PD 30[a]	Chile	3.48	1.12	PD: 63 (Chile) 57 (Spain)
	Spain	3.22	1.09	
PD 31[a]	Chile	2.74	1.18	
	Spain	2.59	0.97	
[a] inverted scale element				

Table 28. Cultural differences comparison for each group of students.

The elements that have more differentiated averages have a margin of 0.67 points. This can be seen between the results of Chile and Spain for items IVR20 and MAS24. In Table 29., we observe that there is evidence to consider significant differences for items IVR20, MAS24, and LTO28 considering the hypothesis Ha: μ Chile $\neq$ μ Spain.

In the IVR20 item we observe that the average differences are consistent with their cultural scores for the IVR dimension. This could indicate that our instrument could detect cultural differences. In the case of item MAS24, the difference is contrary to the cultural scores for the MAS dimension. Considering the results of Cronbach's Alpha (Table 25.), the experts feedback (Table 26.), and the results of the Mann-Whitney U test (Table 29.), we have chosen to modify the question in item MAS24.

Item LTO28 presents a difference that is not explained by the cultural score for the corresponding dimensions. Considering the nature of the sample and the feedback from the experts, we have decided to keep the item.

Item	p-value
IVR20	**0.033**
IVR21	0.642
IDV22	0.376
IDV23	0.835
MAS24	**0.025**
MAS25	0.157
UA26	0.764
UA27	0.487
LTO28	**0.038**
LTO29	0.536
PD30	0.256
PD31	0.733

Table 29. Mann-Whitney U test for cultural differences Chile-Spain.

Item MAS24 has been modified. The version shown to the experts indicates "For students, their university career is more important than their social circle." Considering the feedback from the experts, the question presents a binary scenario that can lead to errors. Additionally, they indicated that the social circle could include social interactions that occur within the university. For these reasons we have decided to modify the question to "For students, it is acceptable to reduce their social interactions in order to improve their academic results."

Item LTO29 has also been modified. The version shown to the experts indicates "When it comes to preparing for assessments, students plan from day one." Considering the experts' feedback, this question is far too personal, being ambitious makes a student speak for a general group of people. Additionally, they indicated that the term "day one" can be very ambiguous. For these reasons we have decided to modify the question to "When it comes to preparing for assessments I plan ahead.

13.4. Discussion About Preliminary Scale

The theory on which our proposal is based shows the lack of research and the importance of incorporating cultural aspects into SX solutions. Within these solutions we believe that an evaluation methodology is the most appropriate to satisfy the HEI's needs considering its flexibility. It is as a method of these methodology that we have proposed the scale presented in this work.

Our scale was developed based on literature and a SX-Cultural model. The incorporated items refer to both the 3 SX dimensions and the 6 national culture dimensions proposed by Hofstede. It has 31 questions and was then evaluated by 12 experts/scholars/professionals from different areas, national contexts, and gender. The instrument was refined in 2 stages under the supervision of experts in the UX/CX area; 2 items were adapted, and 29 items were kept unchanged.

Considering the limited number of participants in the preliminary scale, we believe that it is too ambitious to do an in-depth analysis of the cultural differences between the participants. Even so, after the massive application of the consolidated scale, this analysis is imperative.

In the future we will use structural equation modeling (SEM) to check the underlying model of our scale (Section 15). We intend to use the scale in future surveys in conjunction with other methods within the framework of an evaluation methodology that incorporates cultural aspects. We do not rule out an additional iteration of refinement of the instrument after statistically analyzing the results of its application in students from different educational and cultural contexts.

14. Methodology Formalization and Expert Validation

The concluding phase of this doctoral research entailed the formalization and rigorous validation of our Student eXperience (SX) evaluation methodology, which was grounded in the previously established SX-Cultural model. This methodology underwent a comprehensive review process, wherein it was critically evaluated by a diverse panel of 14 experts, in addition to practical applications of the survey and focus group methods. The evaluators were composed of professionals and educators with varied backgrounds, genders, and cultural perspectives, all of whom possess significant connections to the educational sector. Their multidisciplinary expertise and experience provided invaluable insights into refining and validating the methodology, ensuring that it is both robust and adaptable to a wide range of educational settings. This section offers a concise summary of a publication that details the complete development and validation process of our proposed methodology, emphasizing the contributions and feedback provided by these experts.

14.1. Methodology Formalization

The development of our evaluation methodology adheres to a structured, formal linear research process [208], systematically advancing through three distinct phases: i) the exploratory phase, ii) the descriptive phase, and iii) the relational phase, prior to commencing the formal development stage, which have 2 iterations. Each of these phases was designed to progressively build a comprehensive understanding of the subject matter and establish a strong foundation for the creation of the methodology. As illustrated in Figure 9., the overall development process consists of six key activities, each contributing to the refinement and validation of the proposed evaluation framework:

1. In the initial stage of our research, we conducted a SLR with the objective of gaining a comprehensive understanding of the various definitions and conceptualizations of SX. This review aimed to explore the key areas of interest related to SX, as well as to identify the dimensions, factors, and attributes that constitute the SX framework. Additionally, the SLR examined the different methodologies and evaluation tools commonly employed to assess SX within academic contexts [5, 20]. This foundational work was crucial for informing the subsequent stages of our study.

2. In the second stage of our research, we conducted a comprehensive analysis of the factors and dimensions related to national culture as presented in the existing literature. These cultural elements were systematically compared and contrasted with the findings from the previous stage of our study, which focused on identifying the core dimensions of the SX. This comparative analysis allowed us to refine and align our understanding of how national cultural factors intersect with the SX dimension, thereby providing a more holistic framework for our ongoing work.

3. In the third stage of our research, a comprehensive analysis was conducted on the key concepts identified in the literature related to the dimensions and factors that shape the SX. Additionally, we examined the primary cultural dimensions widely utilized in sociological research to ensure a thorough understanding of how these factors influence student perceptions and interactions within higher education environments. This analysis provided a foundational framework for integrating cultural considerations into the SX model, further enhancing the methodology's applicability across diverse student populations.

4. In the fourth stage of our research, we formulated an SX-Cultural model by integrating the factors and attributes identified in the analysis from stage 3. This model serves as a foundational framework for the development of computational, diagnostic, and methodological solutions tailored to students. It systematically incorporates students' cultural backgrounds to enhance the relevance and effectiveness of these solutions. The SX-Cultural model thus provides a comprehensive basis for addressing the diverse needs of students within higher education environments [174].

5. In the fifth stage, we developed our SX evaluation methodology, which is designed to undergo a thorough process of validation and refinement. This process is divided into three key subprocesses:

    a. Selection of Methods: Drawing from the SX-Cultural model and the insights gained during the exploratory phase, we carefully select the most appropriate and relevant methods to be implemented within the evaluation methodology. This ensures that the methodology is grounded in both theoretical and empirical evidence, tailored to the cultural and SX dimensions identified.

    b. Structuring the Methodology Workflow: The methodology's workflow is systematically divided into five distinct stages, ranging from pre-planning to the final phases of analysis and graphical representation of the results. Each stage is designed to guide the evaluators through a structured process, ensuring that the evaluation is conducted with rigor and consistency across all phases.

    c. Multilingual Documentation and Technical Support: To facilitate the application of the methodology across diverse contexts, we document the formalization of the evaluation process in multiple languages. Additionally, detailed technical documents are prepared to support the multidisciplinary teams responsible for conducting the evaluation. These documents ensure that all team members, regardless of their disciplinary background, can effectively understand and apply the methodology, thus promoting consistency and accuracy in its implementation.

This approach not only ensures the robustness of the evaluation process but also enhances its adaptability and scalability for use in diverse academic and cultural settings.

6. Stage six encompasses, as a key component of the iterative development process, both statistical validation and expert judgment evaluation of the methods integrated into the methodology, as well as the methodology itself. The latest version of the methodology was developed in a two iteration process based on a preliminary version, detailed in Section 12.

   This stage is designed to ensure the robustness and accuracy of the methods employed. Furthermore, we intend to conduct a comprehensive review of the relevant scenarios, organizational factors, and environmental variables that may impact the application of our methodology in diverse academic and cultural settings. This review will help tailor the methodology to various contexts, enhancing its applicability and effectiveness.

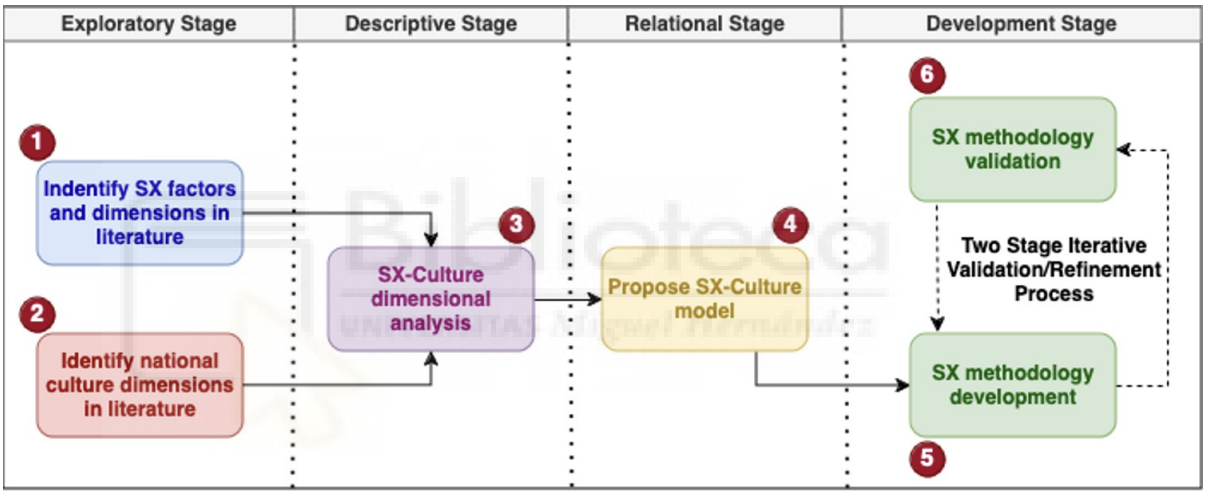

Figure 9. Doctoral Research Iterative Process.

Next, a detailed explanation of the methodology is provided. To facilitate its understanding, each of the stages and substages described has a unique identifier (e.g., S0, S1, S1.1) that is consistent with those used in Figure 10., in addition to Appendix B.

To model the processes of the methodology, Business Process Modeling Notation (BPMN) has been used. Their basic symbols/elements are detailed in Appendix A, for better comprehension of the complete process.

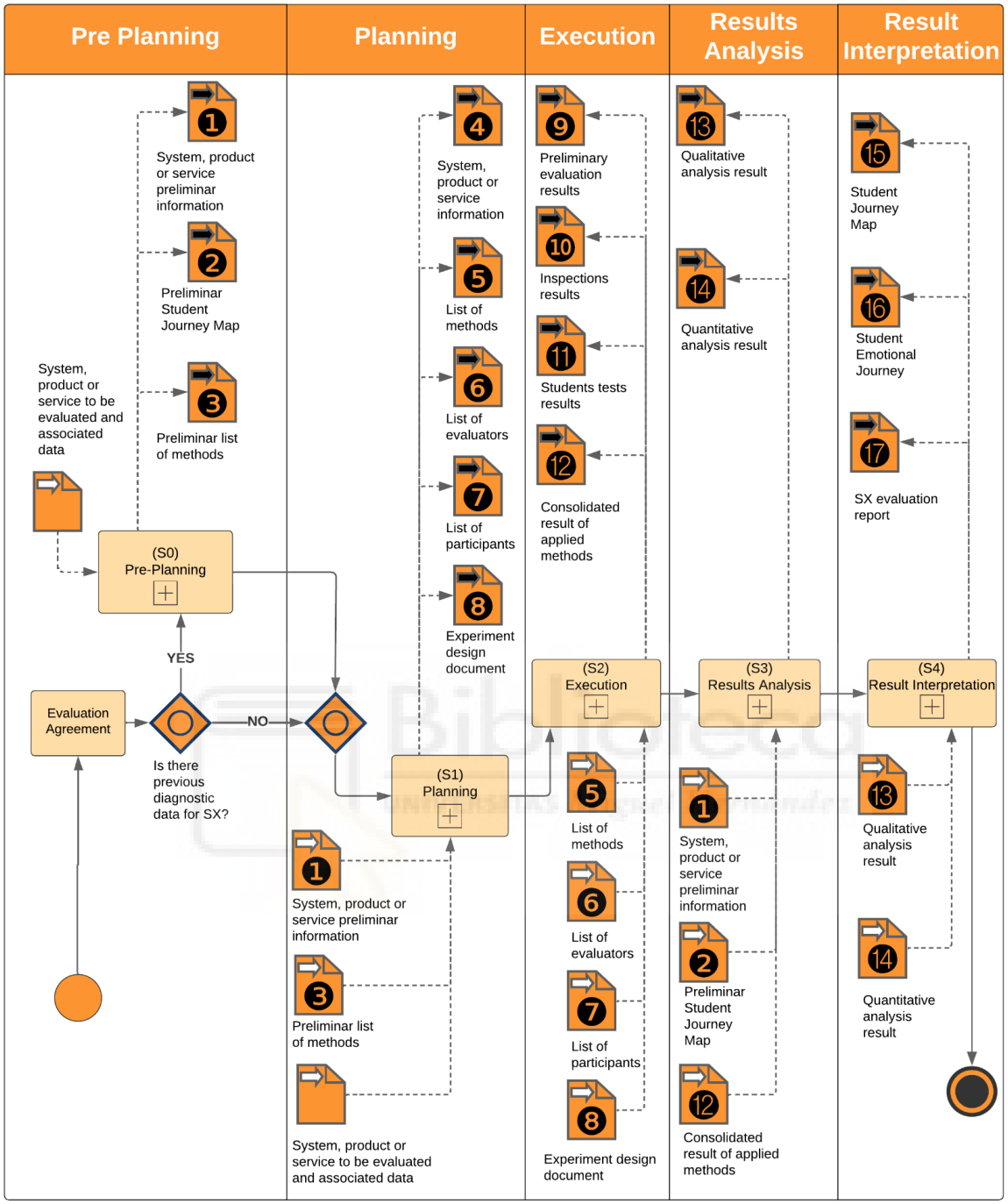

Figure 10. BPMN Diagram - General description of the evaluation methodology.

14.1.1. Stage 0: Pre-Planification

The S0 or Pre-Planning stage is the first of our methodology. Its completion is not mandatory, although we recommend it to be able to carry out a prior diagnosis of the evaluation and thus be able to compare historical data with the results of the evaluation, being able to obtain valuable information regarding the interactions of the students with the systems, products and HEI services.

The Pre-Planning stage aims to collect historical information of interest about HEIs and their students (such as teaching evaluations, results of previous surveys, and market studies) to develop an SJM and propose a preliminary list of methods to use in the evaluation methodology. This depends on the agreed objectives of the evaluation, the limitations detected, the scope of the evaluation, and the available resources. This stage is made up of 3 substages:

1. **Data Collection (S0.1):** Refers to the process of collecting historical information relevant to our evaluation based on the agreed objectives of the evaluation, the limitations detected, the scope of the evaluation, and the available resources.
2. **Preliminary Mapping of the Student Journey (S0.2): Refers** to developing an SJM for each student profile detected or of interest for our study. It is advisable to include the channels, systems, and services that may be of interest as a study objective in this graphic tool.
3. **Preliminary Method Selection (S0.3):** This stage consists of pre-selecting the methods to include in the method execution phase. This selection is made based on the historical information provided by the HEI and the preliminary student journey map as a conceptual guide.

14.1.2. Substage S0.1: Data Collection

The data collection substage consists of collecting historical study data and information about students with the specific profiles defined for the evaluation objective. Information from previous studies includes (but is not limited to):

1. **Teaching evaluations.**
2. **Satisfaction surveys.**
3. **Market studies.**
4. **Student Journey Map (SJM).**

These data will allow the development of an SJM and a preliminary list of methods to use. These elements allow an overview of the student's experience and will facilitate the list of data to be collected, which must be reported to the department in charge of ensuring data confidentiality, such as a bioethics committee, in the Planning Stage.

Additionally, we must have all the necessary information about the systems, products or services to be evaluated, as well as relevant data about the students, such as:

1. **Student graduation rate.**
2. **Student academic performance.**
3. **Retention rates in the first years.**
4. **Dropout rates.**
5. **Demographics of enrolled students.**

This information aims to relate/contrast the qualitative results obtained with the implementation of the selected methods. If we do not have prior information, according to the objectives of the evaluation, all the information of interest must be collected at the beginning of the Planning Stage (S1).

14.1.3. Substage S0.2: Preliminary Mapping of the Student Journey

The Preliminary Student Journey Mapping Substage (P-SJM) aims to graphically represent the diagnostic analysis of student interactions for the profiles of interest of the study. This is based on the information collected in the Data Collection Substage (S0.1).

The P-SJM must prioritize, as much as possible, the representation of student interactions with the infrastructure and services of interest during the evaluation. The preliminary information should be complemented with the results of the inspections in the Execution Stage (S2). The P-SJM will be used to complement or compare the SJM to be developed in the Result Interpretation Stage (S4), which, depending on the availability of time, can be supplemented with a Student Emotional Journey.

14.1.4. Substage S0.3: Preliminary Method Selection

The Preliminary Method Selection Substage aims to develop a tentative list of methods to be used in the Execution Stage (S2). The proposal is based on the information collected in the Data Collection Substage (S0.1) and the P-SJM (S0.2).

The preliminary list of methods must be re-evaluated in the Planning Stage (S1), discarding methods that are not viable due to issues of time, objectives, scope or administrative mishaps, such as the impossibility of working with a specific profile of students. In this way, we recommend overestimating resources and discarding methods that do not align with the proposed or requested objectives of the evaluation to make the preliminary list of methods.

14.1.5. Stage 1: Planning

Stage S1, or Planning Stage, aims to organize the methods to be carried out in the execution stage, coordinate evaluators, and select evaluation participants. This stage is made up of 4 substages:

1. **Method Execution Planning (S1.1):** The final selection process of methods to be applied in the Execution Stage (S2). If historical information from the HEI on SX does not exist or is not available at this stage, the primary data for the evaluation is collected.
2. **Evaluator Selection (S1.2):** This substage refers to the expert evaluators' selection, induction and organization process for each method to be applied in the Execution Stage (S2).
3. **Participant Selection (S1.3):** This substage specifies the interest groups in the evaluation. This process is relevant to defining the groups participating in surveys and focus groups. Additionally, to process the administrative permits necessary to work responsibly with students.

4. **Experiments Design (S1.4):** This substage refers to the process of defining expected results, scenarios and activities to be carried out for each of the methods selected in the Method Execution Planning substage (S1.1).

14.1.6. Substage S1.1: Method Execution Planning

The Method Execution Planning (S1.1) aims to analyze the background information provided by the HEI or the compilation and analysis of available data (if there is no access to historical information from the HEI on SX). This substage contemplates:

1) The collection of current information about HEI students.
2) The analysis or definition of objectives, scope, limitations and execution times of the methods to be applied during the evaluation.
3) Selection of methods based on resources and relevance:
  i) Inspections and usability tests are recommended when evaluating information systems or administrative services. Otherwise, it is possible to omit them.
  ii) With a limited time frame to carry out tests, it is possible to omit interviews or focus groups in tests with students. Otherwise, all tests are recommended to run.
4. Documentation of the methods to be used in the execution phase, in addition to temporal planning.

14.1.7. Substage S1.2: Evaluator Selection

The Evaluator Selection substage (S1.2) aims to select the expert evaluators in charge of executing the methods in the Execution Stage (S2). Although the HEI has freedom of choice of evaluators, we recommend the following:

1. At least one of the selected evaluators must be an expert in the area of UX or CX.
2. In the case of evaluating the interaction with administrative or computer services, selecting personnel familiar with or directly involved in the design/implementation/use of these systems is recommended.
3. The selection of academic experts is recommended.
4. The selection of experts who work in the areas of psychological care with students is recommended.
5. The selection of a leading expert to coordinate the execution of methods must be agreed upon among the evaluators.

14.1.8. Substage S1.3: Participant Selection

The Participant Selection substage (S1.3) aims to specify the group/profile of students targeted by the evaluation and the processing of permits. This specification is crucial when processing the licenses mentioned above, as they are necessary to work with students within the framework of regulations for sustainable and responsible research. The characteristics to be defined include:

1. Student qualifications.
2. Approximate number of students involved in the evaluation.
3. The age range of the students involved in the evaluation (of legal age).
4. Specify if you intend to evaluate the experience of students with a disability specially.
5. As part of the cultural focus of the assessment, it is recommended that the student's cultural background (nationality) be documented.

When processing the necessary permits, defining the data processing method is essential. This includes the mode of storage, whether or not the data is confidential, whether the data will be shared with various entities, the amount of time the data is stored, and whether the data will be analyzed with Artificial Intelligence (AI) tools.

14.1.9. Substage S1.4: Experiments Design

The Experiments Design substage (S1.4) aims to define and document criteria under which the execution of the selected methods of the evaluation methodology will be carried out. This substage contemplates:

1. **Definition of Expected Results:** To ensure compliance with the objectives imposed for the evaluation, we must define a range of expected results that allow us to work on a realistic and verifiable comparative framework. The expected results are determined at the discretion of the person responsible for the evaluation methodology based on the defined objectives. Thus, the limitations of the study must be taken into account.

2. **Definition of Execution Times:** To ensure that the execution of the evaluation meets the times stipulated at the beginning of the process, it is necessary to define the times for planning, execution of the methods, analysis, and interpretation of results. We recommend that execution planning times be carried out, considering temporary slack as a risk reduction mechanism for the evaluation as a whole. The definition of execution times and temporal slack as a mitigation measure is at the discretion of the person responsible for the evaluation methodology.

3. **Definition of Execution Scenarios:** Depending on the available resources, the evaluation context, and/or the nature of the HEIs, it is essential to define the scenarios for executing the methods. These methods can be applied in person, remotely, or through a hybrid approach. For in-person methods, it is crucial to identify the physical spaces available for these purposes. The specific software platforms must be defined for hybrid or remote methods. We strongly recommend conducting in-person surveys and focus groups whenever possible, as this ensures better engagement and yields more reliable results.

4. **Definition of Activities:** For usability inspections in the Execution Stage (S2), It is essential to establish a list of activities for the test subjects, each with a proposed timeframe for completion and clear criteria for success, failure, and improvement. These activities should align closely with the objectives outlined for the evaluation methodology and the identified student profiles.

14.1.10. Stage 2: Execution

Stage S2 aims to apply and document the results of the executed methods. The methods to use in this phase are divided into three groups:

1. **Induction to Evaluators:** For evaluators to achieve the objectives set for the evaluation, before executing the methods, an induction is recommended in which the following topics must be addressed:

    1. Evaluation objectives.
    2. Scope of the evaluation.
    3. Limitations of the evaluation.
    4. Available resources.
    5. Time planning for each method to apply.
    6. Group/Student profile to be evaluated.
    7. Rules on responsible research, with emphasis on the manipulation of sensitive/private data.

2. **Preliminary evaluation:** The Preliminary Evaluation (S2.1) contemplates the application of a **Property Checklist [193]**, which aims to detect early the deficiencies that the systems, products or services provided by the HEIs may have. Applying this preliminary evaluation will allow the evaluators to decide the best courses of action and approaches when applying the rest of the evaluation or inspection methods.

3. **Inspections:** If the evaluation includes the analysis of the interactions and perceptions of students with HEI computer services and systems, the application of the following methods is recommended (S2.2):

    1. **Heuristic Evaluation (S2.2.1) [195].**
    2. **Group Based Expert-Walkthrough (S2.2.2) [197].**
    3. **Perspective Based Inspection (S2.2.3) [194].**

4. **Students Tests:** The Students Tests (S2.3) contemplates the application of the following methods:

    1. **Interview (S2.3.1) [198].**
    2. **Survey (S2.3.2) [199].**
    3. **Focal Group (S2.3.3) [200,201].**

14.1.11. Substage S2.1: Preliminary Evaluation

The Preliminary Evaluation Substage (S2.1) is the first in the Execution Stage (S2). It consists of applying the Property Checklist method, which aims to detect the weaknesses of the different systems, products and services provided by the HEIs to students. Applying this preliminary evaluation will allow the evaluators to decide the best courses of action and approaches when applying the rest of the evaluation or inspection methods. When executing the Property Checklist, we recommend considering the following points:

1. Expert evaluators in the areas of UX or CX with knowledge of usability are needed.
2. Have expert evaluators with an academic, administrative, psychological care, or computer systems development background for use by students.
3. It is recommended that evaluators be familiar with some of the systems, products or services to be evaluated, always considering the scope of the evaluation.
4. Several at least three experts in the UX/CX areas and at least three experts in domain areas are recommended.
5. In the case of evaluating administrative or computer systems of the HEIs, we strongly recommend including experts directly related to the development/implementation/use/evaluation of these services.

As a result of the execution of the Property Checklist, the data set ❻ or Preliminary Evaluation Result is obtained, which will be a fundamental part of the Results Analysis Stage (S3). In Table 30., we present the details of the execution of the Property Checklist method, considering the process's inputs, steps, and outputs.

S2.1: Preliminary Evaluation - Property Checklist	
Input	❺ List of methods. ❻ List of evaluators. ❽ Experiment design document.
Steps	**1.** A Checklist will be designed with the main systems, products and services to be evaluated. **2.** The Checklist with the main background of the elements to be evaluated will be presented to a group of evaluators. **3.** The expert evaluators carry out the evaluation of the elements under analysis, prioritizing their professional judgment from their area of expertise (Psychology, Academia, Administration, IT, among others). **4.** Evaluators are reminded that they must keep a log of the activities carried out and are asked to answer a perception questionnaire to provide their comments and recommendations on the elements under analysis. **5.** The information obtained after applying the Checklist is compiled. **6.** The results obtained are analyzed and the percentage of satisfaction of the elements under analysis is determined.
Outputs	❻ Preliminary evaluation results. **1.** Preliminary satisfaction percentage of systems, products and services for students. **a.** Percentage of satisfaction by category = (average score per category/maximum score to be obtained) * 100. **b.** Total satisfaction percentage = average satisfaction percentage by category. **2.** Comments and/or recommendations from the evaluators.

Table 30. Details of the execution of the Property Checklist method.

14.1.12. Substage S2.2: Inspections

- **Substage S2.2.1: Inspections - Heuristic Evaluation:** The Heuristic Evaluation method (S2.2.1) aims to identify possible usability problems in students' computer services and systems for subsequent analysis and interpretation in the S3 and S4 stages. To carry out the heuristic evaluation, using usability heuristics that are directly related to the evaluation of educational services or in evaluations considering cultural aspects is highly recommended. It is recommended that the heuristic evaluation report to be incorporated into the inspection results contains, but is not limited to, the following elements:

  1) **Index.**
  2) **Introduction.**
  3) **Product to be evaluated.**
  4) **Product Purposes.**
  5) **Evaluation methodology (including a profile of evaluators and experience).**
  6) **Evaluation results, including:**
    i) Problems found.
    ii) Unfulfilled heuristics.
    iii) Ratings assigned by evaluators.
    iv) Ranking problems by criticality.
    v) Ranking problems by severity.
    vi) Comments on the results tables.
    vii) Proposed solutions.
    viii) Positive aspects identified.
  7) **Conclusions.**
  8) **Annexes:** Screenshots and URLs (highlighting the problems found).

As a result of executing the Heuristic Evaluation, the data set Ⓓ, part of the Inspections Results is obtained. In Table 31., we present the details of the execution of the Heuristic Evaluation method, considering the process's inputs, steps, and outputs.

S2.2.1: Inspections - Heuristic Evaluation	
Input	❻ List of evaluators. ❽ Experiment design document. ● Heuristic sets to be used.
Steps	**1.** The main background of the systems to be evaluated is presented to a group of evaluators, along with the evaluation objectives. **2.** The evaluators must answer a preliminary questionnaire in order to document background information on their previous experiences evaluating systems, products or services similar to the current proposal. **3.** **System Evaluation:** Los evaluadores realizan la evaluación de usabilidad del sistema de manera individual y grupal en dos fases: **a.** **First Stage - Individual:** Each evaluator analyzes the selected system, generating a list of potential problems detected, considering the sets of heuristics used. **b.** **First Stage - Groupal:** A group of evaluators develops a single list of potential problems from the individual evaluation findings, eliminating duplicate problems. Subsequently, each potential problem is associated with one or more heuristics from the set of heuristics used. **c.** **Second Stage - Individual:** Each evaluator analyzes each of the potential problems based on frequency and severity. The criticality of each problem is then calculated, adding the frequencies and severities assigned to each potential problem **(c = f + s).** **d.** **Second Stage - Groupal:** A group of evaluators compiles the information from the previous stage and calculates the averages of frequency **(f)**, severity **(s)** and criticality **(c)** for each potential problem detected, generating a list of problems by priority, based on the objectives of the evaluation. **4.** Evaluators answer a perception questionnaire, including comments and observations about the system. **5.** Evaluators are asked to develop a heuristic evaluation report including a list of tasks performed, problems, and solutions.
Outputs	ⓓ Inspections results. **1.** Heuristic evaluation report. **2.** List of possible problems organized by severity **(s)**, frequency **(f)** or criticality **(c)**. **3.** List of tasks performed. **4.** Service or system perception questionnaire.

Table 31. Detail of the execution of the Heuristic Evaluation method.

- **Substage S2.2.2: Inspections - Group-Based Expert Walkthrough:** The Group-Based Expert Walkthrough method (S2.2.2) aims to identify possible usability problems in computer services and systems students use through a group inspection. As a result of the execution of the Group-Based Expert Walkthrough, the data set Ⓓ or Inspection Results is obtained. In Table 32., we present the details of the execution of the method, considering the inputs, steps, and outputs of the process.

S2.2.2: Inspections - Group-Based Expert Walkthrough	
Input	❻ List of evaluators. ❽ Experiment design document.
Steps	**1)** The main background of the systems to be evaluated is presented to a group of evaluators, along with the evaluation objectives. **2)** The evaluators must answer a preliminary questionnaire in order to document background information on their previous experiences evaluating systems, products or services similar to the current proposal. **3) First Stage:** a) A group of evaluators interacts with the service or computer system to be evaluated based on a list of tasks to be performed. b) The evaluator in charge shows the team of evaluators the scenarios and tasks twice. c) Evaluators identify problems and possible improvements in the system design, taking confidential notes. **4) Second Stage:** a) The evaluator in charge shows the team of evaluators the scenarios and tasks twice. b) The evaluators discuss the problems and possible improvements of the system design. c) The evaluators discuss a severity and frequency rating for the detected problems and suggest possible improvements to the system. **5. Third Stage:** ○ Evaluators answer a perception questionnaire, including comments and observations about the system and design options.
Outputs	Ⓓ Inspections results. **1.** List of possible problems. **2.** List of tasks performed. **3.** Service or system perception questionnaire.

Table 32. Detail of the execution of the Group-Based Expert Walkthrough method.

- **Substage S2.2.3: Inspections - Perspective Based Inspection:** The Perspective Based Inspection method (S2.2.3) aims to identify possible specific usability problems in computer services and systems students use through an inspection based on three perspectives. These perspectives are based on three specific types of users:

    1. **Novice:** The novice perspective focuses on searching for general and obvious usability problems, considering that a novice user is unfamiliar with the system, product or service being used.
    2. **Expert:** The expert perspective focuses on the search for specific usability problems, aesthetic problems, and efficiency failures, taking into consideration that an expert user is very familiar with the system, product or service used, as well as similar services.
    3. **Error-Handling:** The error-handling perspective focuses on detecting possible user errors when interacting with the system, product or service used. This perspective seeks to minimize the occurrence and impact of potential errors that system users may make.

We recommend both the incorporation of UX/CX experts in this method and the consideration of the profile of the evaluated students. This includes:

1. **Cultural background.**
2. **Language.**
3. **Degree.**
4. **Age range.**

As result of the execution of the Perspective Based Inspection, the data set Ⓓ or Inspection Results is obtained. In Table 33., we present the details of the execution of the Perspective Based Inspection method, considering the process's inputs, steps and outputs.

S2.2.3: Inspections - Perspective Based Inspection	
Input	❻ List of evaluators. ❽ Experiment design document.
Steps	**1.** The main background of the systems to be evaluated is presented to a group of evaluators, along with the evaluation objectives. **2.** The evaluators must answer a preliminary questionnaire in order to document background information on their previous experiences evaluating systems, products or services similar to the current proposal. **3.** Each evaluator is given a form, different for each perspective. **4.** Each evaluator will evaluate the service or system in the scenario that has been agreed upon at the beginning of the test execution. **5.** The problems detected by each evaluator are documented. **6.** Duplicate issues are removed and similar issues are grouped together. **7.** A frequency **(f)** and severity **(s)** is assigned to each problem. **8.** Each evaluator analyzes each of the potential problems based on frequency and severity. The criticality of each problem is then calculated, adding the frequencies and severities assigned to each potential problem **(c = f + s).** **9.** A list of problems is generated by priority, depending on the objectives of the evaluation. **10.** Evaluators answer a perception questionnaire, including comments and observations about the system.
Outputs	Ⓓ Inspections results. **1.** List of possible problems. **2.** List of tasks performed. **3.** Service or system perception questionnaire.

Table 33. Detail of the execution of the Perspective Based Inspection method.

14.1.13. Substage S2.3: Students tests

- **Substage S2.3.1: Students tests - Interview:** The Interview method (S2.3.1) aims to collect qualitative data from students' experiences for subsequent analysis and interpretation in the S3 and S4 stages. As a result of the execution of the Interview, the data set ⓫ or Students Tests Results is obtained. In Table 34., we present the details of the execution of the Interview method, considering the inputs, steps, and outputs of the process.

S2.3.1: Students Tests - Interview	
Input	❻ List of evaluators. ❼ List of participants. ❽ Experiment design document.
Steps	**1. Interview design:** **a.** The evaluators and the interview execution coordinator(s) may decide the type of interviews to be carried out: . **Structured,** if there are minimal resources. . **Semi-structured,** if there are limited resources. . **Unstructured,** if there are necessary resources. **b.** The experts propose the questions to ask in the interviews and the number of students to interview, depending on the objectives of the evaluation and the available resources. **c.** The experts will determine the scenarios for carrying out the interviews based on the resources and scope of the evaluation. These may be remote, in-person or hybrid, although we recommend in-person execution. **2. Interview execution**: **a.** The interview will be carried out in the modality and in the scenarios proposed by the evaluators designated for this purpose. **b.** Students should be asked for demographic information at the beginning of the interview. **c.** We strongly recommend the collection of audiovisual material for subsequent analysis (e.g., interview recording). **d.** Interviewers should remind students of the confidentiality of their data and request formal consent if necessary. **3. Document the results obtained in the formal document.**
Outputs	⓫ Students tests results. **1.** Qualitative data about the student experience. **2.** Audiovisual material.

Table 34. Detail of the execution of the Interview method.

- **Substage S2.3.2: Students tests - Survey:** The Survey method (S2.3.2) aims to collect qualitative and quantitative data on the experiences and perceptions of students for subsequent analysis and interpretation in the S3 and S4 stages. To prepare the survey, questions were adapted from 2 surveys focused on SX and the student culture [202, 203]. The resulting survey was validated both statistically and by experts. As a result of the execution of the Survey, the data set ⓫ or Students Tests Results is obtained. In Table 35., we present the details of the execution of the Survey method, considering the process's inputs, steps and outputs.

S2.3.2: Students Tests - Survey	
Input	❽ Experiment design document.
Steps	**1.** Adapt the SX evaluation survey proposed by us to the scenarios proposed by the HEI. This includes: **a.** Language adaptation. **b.** Incorporation of distinctive elements of the HEI. **c.** Incorporation of administrative/legal information for taking surveys anonymously (protection of private data). **2.** Coordinate the mass sending of the survey to students with the target profile. **3.** Send the SX evaluation survey to be answered by students. **4.** Send reminders to students considering the time limit for the execution of the survey. **5.** Normalization of obtained data. **6.** Document the results.
Outputs	⓫ Students tests results. **1.** Qualitative results of the SX evaluation survey (open question). **2.** Quantitative results of the SX evaluation survey: ● Student perceptions on a Likert scale from 1 to 5 where 1 corresponds to "Strongly disagree" and 5 to "Strongly agree". **3.** Student Demographics: ● Age. ● Degree. ● Nationality. ● Gender. ● Academic progress.

Table 35. Detail of the execution of the Survey method.

- **Substage S2.3.3: Students tests - Focal Group:** The Focal Group method (S2.3.3) aims to collect qualitative data on students' experiences and perceptions for subsequent analysis and interpretation in the S3 and S4 stages. As a result of the execution of the Focus Group, the data set ⓫ or Students Tests Results is obtained. In Table 36., we present the details of the execution of the Focus Group method, considering the inputs, steps, and outputs of the process.

S2.3.3: Students Tests - Focal Group	
Input	❻ List of evaluators. ❼ List of participants. ❽ Experiment design document.
Steps	**1. Focal Group Design:** **a.** An evaluator will be appointed to be a moderator in the focus group(s). A Professor and/or psychologist is recommended. **b.** Experts are free to ask questions that are necessary to verify data. **c.** Focus groups with a number of 5 to 7 participating students are recommended. **d.** The experts will determine the scenarios for carrying out the interviews based on the resources and scope of the evaluation. These may be remote, in-person or hybrid, although we recommend in-person execution. **2. Focal Group Execution:** **a.** The interview will be carried out in the modality and in the scenarios proposed by the evaluators designated for this purpose. **b.** Students should be asked for demographic information at the beginning of the interview. **c.** Participation of all students should be encouraged. **d.** We strongly recommend the collection of audiovisual material for subsequent analysis (audio recording). **e.** The moderator must remind students of the confidentiality of their data and request formal consent if necessary. **3.** Document the results obtained in the formal document.
Outputs	⓫ Students tests results. **1.** Qualitative data about the student experience. **2.** Audiovisual material.

Table 36. Detail of the execution of the Focus Group method.

14.1.14. Stage 3: Results Analysis

The Results Analysis Stage (S3) corresponds to processing the qualitative and quantitative data obtained in the Execution Stage (S2). The results of this stage consist of an analysis of the data ready to be interpreted, graphed and documented in the Results Interpretation Stage (S4). The analysis of results includes the following substages:

- **Substage S3.1: Qualitative Analysis:** Qualitative analysis consists of the analysis of test results expressed in the form of words (audio) or texts. Qualitative information could come from the results obtained in the execution of the Property Checklist method, from the audiovisual records of the methods executed, the evaluators' logs, the responses received from the evaluation survey, or the students' demographic data. To carry out the qualitative analysis, the following elements must be considered:

    1. **Property Checklist Results:** Evaluators should be required to record comments and observations of each element in the preliminary evaluation of the property checklist.
    2. **Evaluators' logs:** It is recommended that evaluators use logs throughout the evaluation, where they write down their observations regarding the process, the results obtained by each method, and the activities that must be completed.
    3. **Audiovisual Material:** It is recommended that audiovisual material of the inspection methods, interviews, and focus groups be stored for later analysis.
    4. **Evaluation Survey:** It is recommended that the demographic information of the students collected in the initial section of the SX survey be used to analyze the students' cultural background and consider possible data correlations.
    5. **Data Processing:** We recommend using text analysis tools (e.g., Natural Language Processing) to analyze students' emotional fluctuations in the inspection methods, interviews, focus groups, and open questions of the SX evaluation survey.

- **Substage S3.2: Quantitative Analysis:** Quantitative Analysis consists of the analysis of methods results expressed in numerical form. This enables a statistical analysis that establishes causal relationships, correlation, data dispersion, and measurement of magnitudes concerning the data provided by the students. The quantitative data can come from the results obtained in the execution of the Property Checklist method, the list of potential problems, usability tests, responses received in the SX evaluation survey, and the demographic data of the evaluated students. To carry out the quantitative analysis, you must consider the following elements:

1. **Property Checklist Results:** The execution of the Property Checklist involves the qualification of systems, products, or services provided by the HEI on a Likert scale from 1 to 5, where 1 corresponds to the perception of "Totally dissatisfied" and 5 corresponds to the perception of "Totally compliant". This numerical rating allows statistical processing and quantification of compliance percentages by category.
2. **List of potential problems:** The execution of inspections to evaluate the usability of the HEI services and systems is associated with creating a list of potential problems. This list includes the numerical rating of problems by frequency, severity and criticality by the evaluators. This qualification allows the calculation of the dispersion of the results to know the degree of cohesion of the observations.

3. **Evaluation Survey:** The SX Assessment Survey contains questions focused on each dimension of the SX and culture models. Student perceptions were surveyed and classified on a Likert scale from 1 to 5, where 1 corresponds to the perception of "Totally disagree" and 5 corresponds to the perception of "Totally agree." The results of this survey allow the quantification of results and the possibility of establishing data correlation.
4. **Demographic Data:** The demographic data from the evaluation survey and the usability inspections provide valuable information that allows data to be categorized, grouped, and then analyzed statistically and possible correlations evaluated.

14.1.15. Stage 3: Results Interpretation

The final stage (S4) consolidates qualitative and quantitative results into the SX Evaluation Report, incorporating graphic elements, including but not limited to SJM and Emotional Journey. After analyzing the results, the activities to be carried out are the following:

1. **SJM Development:** An SJM is carried out for each student profile of interest to the HEI. The SJM must explicitly and in detail incorporate all the services and systems of interest for evaluation with which students interact. Ideally, these interactions should be evaluated with the inspection techniques in the Execution Stage (S2).
2. **Development of Student Emotional Journey:** The emotional fluctuations are mapped from students' feelings throughout their interactions, exposed in the SJM. This map must be based on the analysis of the qualitative data obtained in the Results Analysis Stage (S3).
3. **Integración y Presentación de Datos:** The SX Report must be drafted incorporating the graphic elements developed in this stage (S4). These graphic elements are not limited to the SJM and the Emotional Journey. It is recommended that the SX Report address the following points:

    1. Executive Summary.
    2. Explanation and Planning of the Methodology.
    3. Preliminary Evaluation Results.
    4. Inspections Results.
    5. Interview(s) Results.
    6. Focal Group(s) Results.
    7. Survey Results.
    8. Results Analysis (focusing on the qualitative and quantitative results of the different student profiles of interest to the HEI).
    9. Analysis of Student Expectations (focusing on the student's cultural analysis by dimensions).
    10. Conclusions and Recommendations for Actions and Policies.
    11. Clarifications, References and Annexes.

14.2. Validation Process

Initially, data regarding students' experiences were collected through the repeated administration of the evaluation scale to various groups of students. Subsequently, a focus group was conducted with students, during which they were asked questions to validate the previously obtained data.

Additionally, versions of the methodology were provided in both Spanish and English to a group of expert evaluators. The evaluators generally agreed that the stages and sub-stages of the methodology are useful for assessing the student experience while taking their cultural backgrounds into consideration.

For the qualitative validation of our methodology, we have selected the Expert Judgement or Expert Evaluation method. This approach is widely used in studies within the fields of UX and software engineering [209], aligning closely with the theoretical and practical framework of our proposal, particularly in relation to the usability testing conducted during the execution stage. Following the selection of experts, each was provided with a comprehensive package of documents, consisting of:

1. A formal letter requesting their participation.
2. A copy of the formalized methodology, translated into the expert's native language.
3. An evaluation form structured into four distinct phases:
    - Introduction: A formal presentation of the purpose of the expert evaluation, where the evaluator also indicates their years of experience in the relevant field.
    - Experience: In this phase, the expert provides details regarding their professional or research background, as well as any previous participation in expert evaluations (Section 14.2.1).
    - Stages Evaluation: Here, the experts assess each of the stages and substages of the methodology using four criteria—Utility, Clarity, Ease of Use, and Lack of Detail—on a Likert scale ranging from 1 to 5 [205] (Section 14.2.2).
    - Commentary: In this section, the experts are invited to offer their comments and suggestions on various aspects of the methodology and its potential application (Section 14.2.3).

The structure of the evaluation process ensures that expert feedback is collected in a comprehensive and systematic manner, providing valuable insights for refining, and enhancing the methodology.

It is important to note that, in order to mitigate potential biases stemming from the evaluators' backgrounds and other external factors, we have deliberately selected expert evaluators from diverse national, cultural, and professional contexts, as well as different areas of expertise and work environments. Additionally, we have actively encouraged the participation of women in the validation process, following the recommendations of the European Commission for the integration of women in research environments [210].

14.2.1 Experts Background

Understanding the background of expert evaluators is essential to ensuring the rigor of the methodology validation process. The evaluators' years of specialization, areas of expertise, and experience working with relevant populations provide vital context for interpreting their feedback and assessments. Their diverse professional backgrounds contribute to a more thorough and comprehensive evaluation of the methodology.

- For this study, we engaged 14 expert evaluators, evenly split between men and women.

- Their areas of expertise span several fields, including: i) Human-Computer Interaction (HCI), ii) User Experience (UX), iii) Customer Experience (CX), iv) Psychology, and v) University-level teaching.

- On average, the experts have 12,43 years of experience in their respective fields, which brings significant depth to the evaluation.

- In response to the question, "Before participating in our research, were you familiar with the concepts of CX or SX?", 78,57% of the experts confirmed their familiarity with these areas.

- Additionally, when asked, "Before becoming a collaborator in our research, have you had experience working with university students?", 85,71% of the experts affirmed prior or ongoing experience working with students, averaging 14,45 years in this capacity.

- Finally, in response to "Have you previously participated in any expert judgment evaluations?", 71,42% of the evaluators indicated prior experience in such evaluation processes.

This expertise and experience ensure that the feedback and assessments provided by the evaluators are well-informed and reliable, offering a strong foundation for the validation of our methodology.

14.2.2. Quantitative Analysis

The analysis of quantitative data is essential in this expert evaluation process, as it offers "objective" insights into the perceived strengths and weaknesses of our methodology. In this regard, Table 37. presents the expert rankings for each stage and substage of the methodology, assessed based on four key attributes: utility, clarity, ease of use, and level of detail (Lack of detail). A systematic analysis of these rankings allows for the identification of patterns, the prioritization of areas for improvement, and the assurance that the methodology aligns with the practical needs of its intended users. This process is further enriched by the diverse backgrounds and expertise of the evaluators. The quantitative analysis serves as a vital complement to qualitative feedback, ensuring a balanced and comprehensive evaluation of the methodology.

Stage	Utility		Clarity		Ease of use		Lack of detail	
	AVG	SD	AVG	SD	AVG	SD	AVG	SD
S0: Pre Planification	4,71	0,45	4,00	1,07	3,50	0,73	2,29	1,22
S0.1: Data Collection	4,86	0,35	4,21	0,86	3,36	0,89	2,07	1,16
S0.2: Preliminary Mapping of the Student Journey	4,36	1,04	3,79	1,32	3,07	1,03	2,36	1,11
S0.3: Preliminary Method Selection	4,79	0,41	3,64	1,34	3,50	1,05	2,36	1,34
S1: Planning	4,86	0,35	4,07	0,88	3,50	0,91	2,14	1,06
S1.1: Method Execution Planning	4,79	0,41	4,21	0,86	3,43	0,98	2,14	1,06
S1.2: Evaluator Selection	4,79	0,41	4,29	0,88	3,79	0,94	2,21	1,15
S1.3: Participant Selection	4,79	0,41	4,07	1,03	3,71	0,96	2,29	1,16
S1.4: Experiments Design	4,86	0,35	4,00	1,07	3,29	0,96	2,21	1,21
S2: Execution	4,79	0,41	4,07	1,10	3,57	0,82	2,29	1,28
S2.1: Preliminary Evaluation	4,79	0,41	4,07	1,03	3,79	0,94	2,21	1,15
S2.2: Inspections	4,64	0,61	4,07	1,03	3,57	0,90	2,21	1,15
S2.3: Students tests	4,93	0,26	3,93	1,10	3,71	0,80	2,14	1,06
S3: Results Analysis	4,93	0,26	4,07	1,16	3,36	0,97	2,21	1,26
S3.1: Qualitative Analysis	4,93	0,26	4,00	1,13	3,14	0,99	2,21	1,26
S3.2: Quantitative Analysis	4,93	0,26	4,07	1,16	3,50	0,91	2,14	1,19
S4: Result Interpretation	4,57	1,05	3,86	1,30	3,07	0,88	2,43	1,45
Average per factor	**4,78**		**4,03**		**3,46**		**2,24**	

Table 37. Expert rankings for each stage and substage according to the defined attributes.

- **Utility:** The average expert rating for the utility attribute was 4,78, indicating a strong positive perception of the methodology's usefulness. The stage with the highest utility rating was S3 – Result Analysis, which scored an impressive 4,93. This suggests that experts highly value the process of analyzing both quantitative and qualitative data, including how the data is integrated. On the other hand, S4 – Result Interpretation received the lowest score for utility, with a rating of 4,57. This slight dip can be attributed to a significant deviation in one evaluator's score, reflected in a standard deviation of 1,05. This deviation correlates with the results from the clarity and ease of use attributes, which will be discussed in the following sections, along with additional feedback from the evaluators.

- **Clarity:** The average clarity rating was 4,03, which is still notably high. The stages with the best clarity scores were S1, S2, and S3, each receiving a rating of 4,07. However, the clarity of S4 – Result Interpretation received the lowest score, averaging 3,86 (slightly positive), with a relatively large standard deviation of 1,30, indicating varying levels of clarity as perceived by the evaluators.

- **Ease of Use:** The ease of use attribute received an average score of 3,46, reflecting a moderately positive perception. The stage with the highest ease of use rating was S2 – Execution, scoring 3,57. In contrast, S4 – Result Interpretation was rated lowest in this category, with an average score of 3,07, indicating some challenges in ease of implementation, albeit still a slightly positive rating.

- **Lack of Detail:** This attribute was evaluated negatively, meaning that lower scores are more favorable. The average rating for lack of detail was 2,24, which is considered highly positive. The stage with the best rating for this attribute was S1 – Planning, with a score of 2,14, indicating that the planning stage was perceived as sufficiently detailed. The lowest score in this category was for S4 – Result Interpretation, which still maintained a positive score of 2,43, but indicates room for improvement in providing additional details.

In light of the Ease of Use scores and the relatively lower ratings for S4 – Result Interpretation, combined with the feedback provided by the evaluators (Section 14.2.3.), we have decided to introduce templates and guidance documents to facilitate the efficient application of the methodology. Furthermore, we will expand the explanation of Stage S4 to ensure better clarity and ease of understanding for future users.

14.2.3. Qualitative Analysis

To complement the quantitative data from our methodology evaluation, we included a section for expert opinions, where evaluators provided relevant textual feedback to help identify weaknesses, strengths, and potential improvements for our proposal. The opinion section consists of eight questions—three general and parameterized, and five more specific, open-ended questions. The three general questions are as follows:

1. "If you had to evaluate the student experience when using systems, products, or services offered by Higher Education Institutions (HEIs), would you use our proposed methodology?"
    - The predominant response was "Definitely Yes," with 42.86%, followed by "Probably Yes" at 35.71%.

2. "Do you think the methodology covers all aspects to be evaluated regarding university students' experiences?"
    - The predominant response was "Probably Yes," with 50% of the responses, followed by "Neutral" at 28.58%.

3. "Do you think the methodology could be useful for evaluating the experiences of students from diverse cultural backgrounds?"
    - The predominant response was "Probably Yes," with 42.86% of the responses, followed by "Definitely Yes" and "Yes," each with 21.43% of the responses.

The five specific, open-ended questions are as follows:

- **Question 1 (Q1):** "Would you remove or add any evaluation method in the methodology? Which one(s)? Why?"

- **Question 2 (Q2):** "Would you change, add, or remove aspects of any stage or sub-stage of the methodology? Which one(s)? Why?"

- **Question 3 (Q3):** "Would you change, add, or eliminate any aspect of the evaluation methods considered in the proposed methodology? Which one(s)? Why?"

- **Question 4 (Q4):** "What aspects do you consider were not covered by the methodology and should be included?"

- **Question 5 (Q5):** "Do you have any additional comments or suggestions for the authors?"

The experts' comments on questions Q1-5 are presented in Tables 38.-42. below. It should be noted that comments referring to the better wording of certain points or the consideration of general aspects of the methodology have been omitted, as these are not relevant to the questions raised. Nevertheless, all comments of this nature were taken into consideration.

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Comment	Has this been taken into consideration?	Action/Justification
I would like to propose the inclusion of tools to strengthen the quantitative analysis of the data, thereby enabling the utilization of learning analytics.	Yes	We have refined the explanation of the Results Analysis phase by highlighting certain tools that may be beneficial for data analysis.
Regarding the Customer Journey Map (CJM) and Student Journey Map (SJM), is the objective to generate a single journey map or a set of maps? Whose journey maps are being developed? Is there a singular emotional journey being represented?	Yes	We have stated in the corresponding sections that the Student Journey Maps (SJMs) should be developed or gathered for each relevant student profile, and that the emotional journeys should complement these SJMs.
I recommend adding usability testing as a method for evaluating digital systems (e.g., websites, mobile applications). While usability testing is mentioned, it is not detailed to the same extent—particularly concerning recommendations—as methods such as inspections, surveys, and interviews.	No	The Usability Inspections substage includes methods that address the evaluation of websites and mobile applications. Given the flexibility of our methodology, the Higher Education Institution (HEI) has complete freedom to supplement the obtained results with other tools it deems necessary.
Additionally, I suggest incorporating an analysis that integrates both quantitative and qualitative data.	Yes	We have enhanced the explanation of the Results Analysis phase, emphasizing that this phase involves the integration of both quantitative and qualitative data. Additionally, we have included a recommendation to utilize automated data analysis techniques to strengthen the analytical process.

Table 38. Evaluators' responses to question 'Q1'.

Comment	Has this been taken into consideration?	Action/Justification
There is insufficient information regarding the number of evaluators required during the evaluator selection stage.	Yes	Although it is not explicitly specified in the section—to preserve the flexibility of the methodology—we have included a suggested number of experts for the methods to be implemented.
It is recommended to include, in the S0 Pre-Planning stage, a brief and structured interview with a stakeholder, professional, academic, or official who is closely associated with the service, system, or product to be evaluated.	No	The agreements with stakeholders, professionals, academics, or officials are stipulated in the evaluation agreement, which constitutes the input to start the evaluation process.
Developing this map during the pre-planning stage can be challenging without complete clarity of all necessary data.	No	The document stipulates that if there is insufficient information available to perform the tasks of the pre-planning stage, the process should proceed to the subsequent stages. This provision ensures that the methodology remains flexible and can continue effectively, even in the absence of preliminary data required for the pre-planning activities.

Table 39. Evaluators' responses to question 'Q2'.

Comment	Has this been taken into consideration?	Action/Justification
I suggest incorporating additional sub-stages into the results interpretation stage.	Yes	In the absence of further justification to implement this action, we have opted to refine the wording and provide a more comprehensive explanation of this stage.
Ideally, the total number of participants and the minimum number of evaluators required should be established.	Yes	We have included a suggested number of experts for the methods to be implemented. The number of students participating should be maintained at the level of a representative sample; this is at the discretion of the Higher Education Institution (HEI) and is subject to its technical and administrative limitations.
Please specify the number of participants necessary to ensure the quality of the methodology's application.	No	The number of students participating should be maintained at the level of a representative sample; this is at the discretion of the Higher Education Institution (HEI) and is subject to its technical and administrative limitations.

Table 39. (continuation) Evaluators' responses to question 'Q2'.

Comment	Has this been taken into consideration?	Action/Justification
To enhance the planning process, it is recommended to include a substage dedicated to defining evaluation objectives and key performance indicators (KPIs). Clearly articulating what the evaluation aims to achieve and specifying how success will be measured are critical components for effective planning.	Yes	We have mentioned in the formal methodology document some KPIs such as student satisfaction surveys, graduation rates, retention rates, and academic achievement, which provide quantifiable metrics to assess educational quality. These should be considered during the Pre-Planning and/or Planning stage.
In the Preliminary Mapping stage of the Student Journey, it would be highly beneficial and provide greater clarity to include a reference mapping that encompasses at least the most common contact points among five to seven different Higher Education Institutions (HEIs).	No	Given the vast diversity of universities, cultures, legislations, and constantly evolving administrative systems, it is impractical to provide example data that would be universally applicable or useful. Therefore, we recommend considering external Higher Education Institutions (HEIs) when establishing the evaluation objectives, taking into account the competitive advantage that our methodology offers.
I suggest incorporating graphic examples of the Student Journey Map (SJM) and emotional mapping methods in the appendices or as external references. Including these visual examples would aid in illustrating the methods and enhance overall understanding.	Yes	We have decided to include generic documents and templates of the key documents to be incorporated and considered throughout the evaluation process.

Table 40. Evaluators' responses to question 'Q3'.

Comment	Has this been taken into consideration?	Action/Justification
Addressing ethical considerations is essential in any evaluation methodology. This includes obtaining informed consent from participants, ensuring privacy and confidentiality of data, and mitigating any potential risks or harms to participants.	No	The aspects of legal compliance and ethics have already been incorporated into the detail of the methods. These will be made more explicit.
Include gender-related aspects	Yes	We have explicitly included the necessity and importance of assembling an evaluation team with diverse cultural, national, academic, professional, and gender backgrounds.
I recommend attaching templates for all major deliverables.	Yes	We have decided to include generic documents and templates of the key documents to be incorporated and considered throughout the evaluation process.

Table 41. Evaluators' responses to question 'Q4'.

Comment	Has this been taken into consideration?	Action/Justification
I recommend adding references, examples and/or templates to understand what is expected from a "student map" in relation to SX.	Yes	We have decided to include generic documents and templates of the key documents to be incorporated and considered throughout the evaluation process.
Gender should be considered both in the selection of participants (evaluators and students) and when analyzing data.	Yes	We have explicitly included the necessity and importance of assembling an evaluation team with diverse cultural, national, academic, professional, and gender backgrounds.
It would be useful to add estimates of execution time for each stage.	No	It is not feasible to provide a time estimation for the execution of the methods or the methodology in its entirety, due to the wide range of scenarios that can occur from one Higher Education Institution (HEI) to another, as well as the differing administrative systems, varying levels of urgency in evaluations, and disparities in available resources.

Table 41.(continuation) Evaluators' responses to question 'Q4'.

Comment	Has this been taken into consideration?	Action/Justification
Including practical examples and case studies would significantly aid in illustrating how the methodology can be applied in real-world settings. This approach enhances understanding and facilitates implementation by providing concrete examples of successful evaluation practices.	Yes	We have decided to include generic documents and templates of the key documents to be incorporated and considered throughout the evaluation process. This enhancement aims to provide evaluators with practical resources that facilitate the implementation of the methodology.
Furthermore, I recommend that the glossary encompass not only definitions of key concepts but also brief summaries of the methods employed. This inclusion would enable evaluators to attain an immediate understanding without the necessity of consulting the full studies.	Yes	We have decided to include a brief summary of the methods, complemented with sample documents and templates

Table 42. Evaluators' responses to question 'Q5'.

15. Structural Equation Modeling Applied to the SX Evaluation Scale

Structural Equation Modeling (SEM) is considered a second-generation technique for multivariable data analysis. Unlike other analytical techniques, such as multiple regression or logistic regression, SEM allows for the consideration of unobservable or 'latent' variables, measurement errors, and the use of complex structural models to address problems with dependent and independent variables [211].

The application of SEM models to validate the items in a survey involves modeling the complex relationships between latent variables (unobservable or abstract constructs) and observed variables (survey items). SEM allows us to evaluate how the items relate to the underlying constructs and how those constructs are related to each other. Through SEM, factor loading coefficients can be estimated to assess the relationship between the items and the constructs.

Given the nature of our survey items, which are based on the SX-Culture Model, it is essential to use tools that account for unobservable or 'latent' variables to analyze the relationships between observable variables and underlying constructs. For this reason, we have decided to apply SEM to analyze the relationships between the different variables or items that comprise our evaluation survey.

Structural equation models are composed of two sub-models. First, the inner structural model, which deals with the relationships between latent variables. The second model is known as the outer measurement model, which focuses on measuring the latent variables. The application of SEM in solutions focused on higher education is not new [212-215]. In our case, the use of SEM aims to establish the relationships between two theoretical constructs, SX and culture, by linking them to the items developed to capture the perceptions of students in a HEI.

15.1. Methodology

The data for the study was collected through the administration of the SX evaluation survey to undergraduate students at the Universidad Miguel Hernández de Elche (UMH) in Spain and the Pontificia Universidad Católica de Valparaíso (PUCV) in Chile. The data will then be analyzed using the R programming software [216], employing specialized libraries for the application of PLS-SEM. We have considered the use of the 'seminr' package, given its extensive documentation and practical flexibility [217].

The necessary steps for applying SEM in R include: i) specifying the measurement model, ii) defining the structural model, iii) estimating the model, and iv) evaluating and interpreting the results.

15.2. Specification of the Measurement Model

First, we define the latent constructs and their corresponding items for each dimension in our proposal:

- Three-dimensional SX model with its respective items:
    - Educational Dimension (ED): ED01 to ED09
    - Social Dimension (SO): SO10 to SO16
    - Personal Dimension (PE): PE17 and PE18

- Six-dimensional Cultural model with its respective items:
    - Indulgence/Restraint (IVR): IVR20 and IVR21
    - Individualism/Collectivism (IDV): IDV22 and IDV23
    - Masculinity/Femininity (MAS): MAS24 and MAS25
    - Uncertainty Avoidance (UA): UA26 and UA27
    - Long-Term/Short-Term Orientation (LTO): LTO28 and LTO29
    - Power Distance (PD): PD30 and PD31

15.3. Definition of the Structural Model

Next, it's necessary to define the relationships between the dimensions of the educational and cultural models. Figure 11., schematically details the relationship between the theoretical constructs of SX and cultural factors present in the evaluation survey in relation to the items. The items are based on previous tools and studies in the area of education and student culture. Their statistical reliability was calculated after a pilot test.

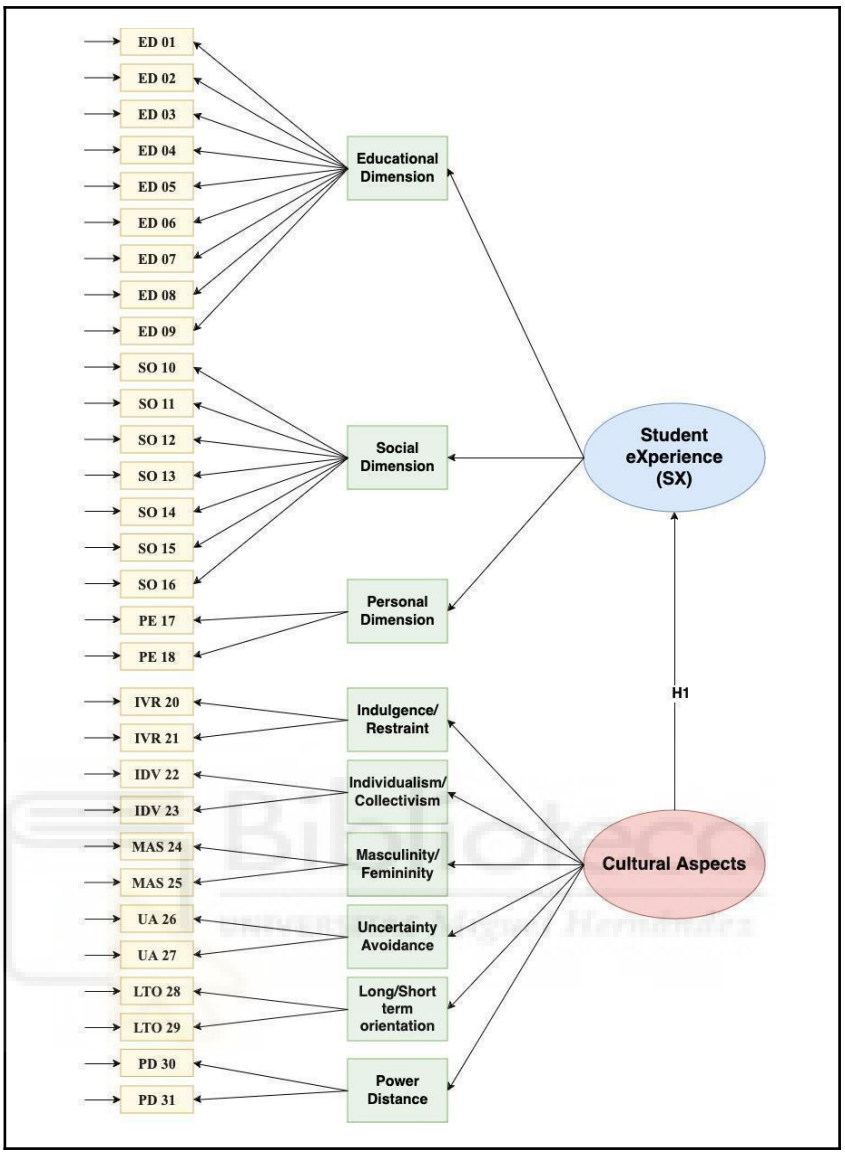

Figure 11. Structural Model for the Scale Items.

Hypothesis 'H1' refers to the influence that culture may have on students' perception of SX.

15.4. Model Estimation

A fundamental part of the SEM analysis process is the model estimation stage, which is performed to fit the theoretical model to the observed data. In this stage, the parameter values for the SX and cultural models are established. The parameters to be determined include regression coefficients, variances and covariances of measurement errors, as well as factor loadings. By using the seminr package in R, the parameters are automatically calculated based on the defined structures (dimensions and items) and the data provided to the model (results from the SX evaluation survey).

15.5. Model Evaluation

The evaluation of the model involves the application of a series of metrics aimed at determining the validity and quality of a model. The evaluation is typically divided into two processes: one for the measurement model (outer model) and another for the structural model (inner model).

Subsequently, the evaluation results must be interpreted. This is usually done based on pre-established reference values (e.g., Cronbach's alpha values greater than 0.7), along with a critical analysis considering the nature of the problem and the model being analyzed.

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16. Study Limitations

The primary limitations of our study stem from the inherently complex nature of the SX. Students' expectations and perceptions of their educational experiences vary significantly across different educational levels—whether they are in primary, secondary, or tertiary education. This diversity in expectations is influenced not only by age and academic maturity but also by the varying roles and responsibilities students encounter as they progress through different educational stages.

Moreover, these variations exist irrespective of cultural contexts, making it clear that the SX cannot be viewed through a one-size-fits-all lens. Our current study is specifically tailored to undergraduate university students, focusing on their unique experiences, expectations, and challenges. As such, any attempts to apply our methodology or findings to students at other educational levels may yield results that are less efficient or even irrelevant, given the differing dynamics and challenges faced by students outside the tertiary education sphere.

In addition to these considerations, it is essential to address an important cultural dimension that has implications for our study. The “Masculinity vs. Femininity” dimension within Hofstede’s cultural model has recently undergone a significant transformation, having been renamed as “Motivation towards Achievement and Success” [218]. This change was motivated by critiques from scholars who argued that the original terminology risked reinforcing gender stereotypes by associating certain values and behaviors with socially constructed gender roles. They posited that such a framing could perpetuate a biased perspective, potentially overlooking the nuances of how achievement and success are defined across different cultures [219].

Given that this adjustment to Hofstede’s model is recent and that previously published works have consistently used the original terminology, we have chosen to retain the traditional name in specific parts of this document for the sake of consistency and historical accuracy. However, we have made a concerted effort to highlight this change in this section, ensuring transparency in our approach. Moving forward, future research and publications will fully incorporate this updated terminology, reflecting our commitment to evolving cultural understandings and reducing gender-based biases in academic discourse.

17. Conclusion and Future Work

The findings of this doctoral research highlight that the concept of SX is not only complex but also inherently multifaceted, encompassing a wide range of definitions and interpretations across academic literature [20, 220, 221]. Our extensive review has revealed that while these definitions may differ, there are several consistent elements that shape the SX, such as a strong focus on learning experiences, student engagement, service interactions, and the influence of cultural factors. By integrating principles from CX into the SX framework, this research has successfully developed a comprehensive and holistic model that captures both academic and non-academic aspects of student life. This model recognizes that students, much like customers in a traditional service setting, interact with HEIs in diverse ways, which significantly impacts their overall experience [20].

In today's rapidly changing educational landscape, the importance of an effective SX evaluation methodology has never been more apparent. Contemporary challenges such as the COVID-19 pandemic, which disrupted conventional learning methods, and the ongoing global migration crisis have placed additional pressure on HEIs to adapt to an increasingly diverse and multicultural student population [1, 4]. These events have underscored the need for institutions to be proactive in addressing the evolving expectations and requirements of their students. By incorporating cultural dimensions into our proposed methodology, this research offers HEIs a robust tool for evaluating and enhancing the quality of their educational services. This cultural sensitivity ensures that the evaluation process is not only equitable and inclusive but also responsive to the unique needs of each student demographic, thereby promoting access, equity, and quality in higher education.

The validation process of this evaluation methodology, carried out through an extensive consultation with multidisciplinary experts, has confirmed its relevance, adaptability, and potential for application across a range of educational settings. This validation involved experts from diverse fields, including education, sociology, psychology, and HCI, who provided valuable insights into refining the methodology. Their contributions were instrumental in ensuring that the proposed tool is both comprehensive and capable of addressing the complexities of the SX. The structured, adaptable, and culturally sensitive approach of the methodology allows institutions to systematically identify and address areas for improvement, thereby enhancing the overall student experience. This adaptability ensures that HEIs can implement the methodology in a manner that aligns with their specific institutional goals, resources, and student demographics.

Looking ahead, this doctoral research lays a solid foundation for the future refinement and expansion of the SX evaluation methodology. Given the dynamic nature of higher education, an iterative process will be essential to adapt the methodology to emerging trends, societal changes, and evolving regulatory frameworks. By leveraging the SX-Cultural model developed in this study, future iterations will focus on integrating more specialized evaluation methods, such as heuristic evaluation techniques tailored for multicultural environments [182]. These specialized methods will enable a more nuanced and accurate assessment of student experiences, ensuring that the methodology remains relevant and effective in diverse educational contexts.

In conclusion, the proposed SX evaluation methodology stands as a significant contribution to the field of educational quality assurance, offering HEIs a powerful tool for enhancing the quality, relevance, and inclusivity of their educational offerings. By embracing the principles and practices outlined in this research, institutions will be better equipped to understand and address the diverse needs of their student populations, creating an educational environment that is responsive, inclusive, and culturally attuned. This approach aligns with UNESCO's Sustainable Development Goals and underscores the role of culturally sensitive evaluation practices in promoting educational excellence on a global scale [222, 223]. As HEIs continue to evolve and adapt to the demands of an increasingly diverse student body, the integration of such methodologies will be crucial in fostering environments where all students can thrive and achieve their full potential.

Finally, I would like to express my deepest gratitude to the Doctoral Program in in Statistics, Optimization, and Applied Mathematics at the UMH, to the Doctoral Program in Informatics Engineering at the PUCV, the Doctoral Program and the National Agency for Research and Development (ANID) for their invaluable support and guidance throughout the course of my postgraduate studies. This assistance was instrumental in enabling the successful completion of this research, providing essential resources, academic mentorship, and financial support. The contributions from these esteemed institutions not only facilitated the advancement of this work but also significantly enriched my academic and professional development, for which I am sincerely appreciative.

18. Conclusiones

Los hallazgos de esta investigación doctoral destacan que el concepto de SX no solo es complejo, sino también inherentemente multifacético, abarcando una amplia gama de definiciones e interpretaciones en la literatura académica [20, 220, 221]. Nuestra extensa revisión ha revelado que, aunque estas definiciones pueden diferir, existen varios elementos consistentes que conforman la SX, como un fuerte enfoque en las experiencias de aprendizaje, el compromiso estudiantil, las interacciones de servicio y la influencia de factores culturales. Al integrar principios de CX en el marco de SX, esta investigación ha desarrollado exitosamente un modelo integral y holístico que captura tanto los aspectos académicos como no académicos de la vida estudiantil. Este modelo reconoce que los estudiantes, al igual que los clientes en un entorno de servicio tradicional, interactúan con las Instituciones de Educación Superior (IES) de diversas maneras, lo que impacta significativamente en su experiencia general [20].

En el panorama educativo actual, que cambia rápidamente, la importancia de una metodología efectiva de evaluación del SX nunca ha sido más evidente. Desafíos contemporáneos como la pandemia de COVID-19, que interrumpió los métodos convencionales de aprendizaje, y la actual crisis global de migración han ejercido una presión adicional sobre las IES para adaptarse a una población estudiantil cada vez más diversa y multicultural [1, 4]. Estos eventos han subrayado la necesidad de que las instituciones sean proactivas en abordar las expectativas y requerimientos cambiantes de sus estudiantes. Al incorporar dimensiones culturales en nuestra metodología propuesta, esta investigación ofrece a las IES una herramienta robusta para evaluar y mejorar la calidad de sus servicios educativos. Esta sensibilidad cultural asegura que el proceso de evaluación no solo sea equitativo e inclusivo, sino también responda a las necesidades únicas de cada demografía estudiantil, promoviendo así el acceso, la equidad y la calidad en la educación superior.

El proceso de validación de esta metodología de evaluación, llevado a cabo mediante una extensa consulta con expertos multidisciplinarios, ha confirmado su relevancia, adaptabilidad y potencial de aplicación en una variedad de entornos educativos. Esta validación involucró a expertos de diversos campos, incluyendo educación, sociología, psicología y HCI, quienes proporcionaron valiosos aportes para refinar la metodología. Sus contribuciones fueron fundamentales para asegurar que la herramienta propuesta sea tanto integral como capaz de abordar las complejidades de la SX. El enfoque estructurado, adaptable y culturalmente sensible de la metodología permite a las instituciones identificar y abordar sistemáticamente áreas de mejora, mejorando así la experiencia estudiantil en general. Esta adaptabilidad asegura que las IES puedan implementar la metodología de una manera que se alinee con sus objetivos institucionales específicos, recursos y demografías estudiantiles.

De cara al futuro, esta investigación doctoral sienta una base sólida para el refinamiento y expansión futuros de la metodología de evaluación de la SX. Dada la naturaleza dinámica de la educación superior, un proceso iterativo será esencial para adaptar la metodología a las tendencias emergentes, los cambios sociales y los marcos regulatorios en evolución. Aprovechando el modelo SX-Cultural desarrollado en este estudio, las futuras iteraciones se centrarán en integrar métodos de evaluación más especializados, como técnicas de evaluación heurística adaptadas para entornos multiculturales [182].

Estos métodos especializados permitirán una evaluación más matizada y precisa de las experiencias estudiantiles, asegurando que la metodología siga siendo relevante y efectiva en diversos contextos educativos.

En conclusión, la metodología de evaluación de la SX propuesta representa una contribución significativa al campo de la garantía de calidad educativa, ofreciendo a las IES una herramienta poderosa para mejorar la calidad, relevancia e inclusividad de sus ofertas educativas. Al adoptar los principios y prácticas delineados en esta investigación, las instituciones estarán mejor equipadas para comprender y abordar las diversas necesidades de sus poblaciones estudiantiles, creando un entorno educativo que sea receptivo, inclusivo y culturalmente sintonizado. Este enfoque se alinea con los Objetivos de Desarrollo Sostenible de la UNESCO y subraya el papel de las prácticas de evaluación culturalmente sensibles en la promoción de la excelencia educativa a escala global [222, 223]. A medida que las IES continúan evolucionando y adaptándose a las demandas de un cuerpo estudiantil cada vez más diverso, la integración de tales metodologías será crucial para fomentar entornos donde todos los estudiantes puedan prosperar y alcanzar su máximo potencial.

Finalmente, me gustaría expresar mi más profundo agradecimiento al Programa de Doctorado en Estadística, Optimización y Matemáticas Aplicadas de la UMH, al Programa de Doctorado en Ingeniería Informática de la PUCV y a la Agencia Nacional de Investigación y Desarrollo (ANID) por su invaluable apoyo y guía a lo largo de mis estudios de posgrado. Esta asistencia fue fundamental para permitir la exitosa finalización de esta investigación, proporcionando recursos esenciales, mentoría académica y apoyo financiero. Las contribuciones de estas prestigiosas instituciones no solo facilitaron el avance de este trabajo, sino que también enriquecieron significativamente mi desarrollo académico y profesional, por lo cual estoy sinceramente agradecido.

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APPENDIX A

This section describes the elements of the Business Process Modeling Notation (BPMN) used to describe the proposed methodology.

Events		
Name	**Notation**	**Description**
Start		Element that represents the beginning of a process.
End		Element that represents the end of a process.

Table A. BPMN notation for events.

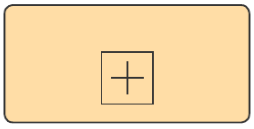
Activities		
Name	**Notation**	**Description**
Activity		Element that represents an activity to be carried out as part of a workflow.
Sub-process		Element that represents a set of activities to be carried out as part of a workflow. This set can be subdivided into several levels of detail called "tasks" and become part of particular workflows.

Table B. BPMN notation for activities.

Gateways		
Name	**Notation**	**Description**
Inclusive Gateway		Element that represents the splitting of a process flow into two or more flows. The use of this element allows the execution of more than one activity at the same time.
Exclusive Gateway		Element that represents the evaluation of a course of action, which can lead to different mutually exclusive alternative workflows.
Parallel Gateway		Element that represents the splitting of a workflow into two or more flows. The use of this element allows the execution of more than one activity at the same time, synchronously.

Table C. BPMN notation for gateways.

Artifacts		
Name	**Notation**	**Description**
Commentary		Element that represents a comment within a workflow. This is used to make clarifications or provide additional information about the elements of a process.

Table D. BPMN notation for artifacts.

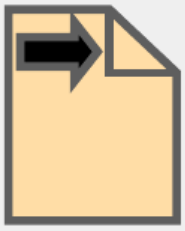
Data		
Name	**Notation**	**Description**
Data object		Element (document, data, etc.) that will be used and transformed through the workflow. It can be created or modified by one or more activities.
Data input		Necessary element (document, data, etc) to start an activity.
Data output		Element that represents the tangible result of an activity (document, data, etc).

Table E. BPMN notation for input and output data.

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APPENDIX B

This section presents the BPMN diagrams of each stage and substage that comprise the evaluation methodology, described in the Section 14.1. of the document.

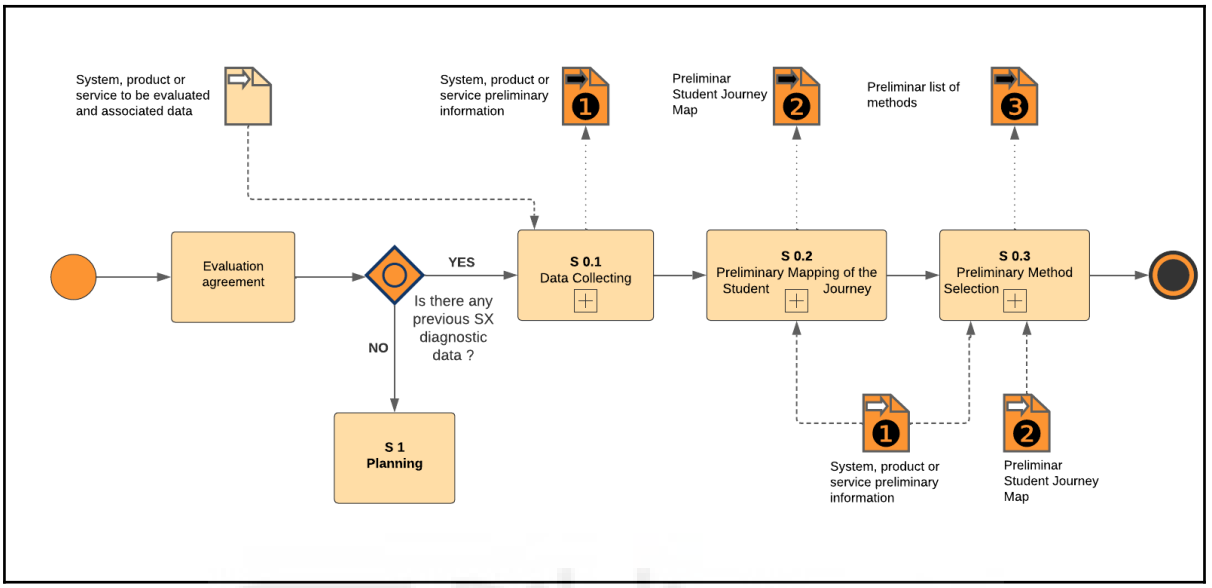

Figure A. BPMN Diagram - S0 Pre-Planning Stage.

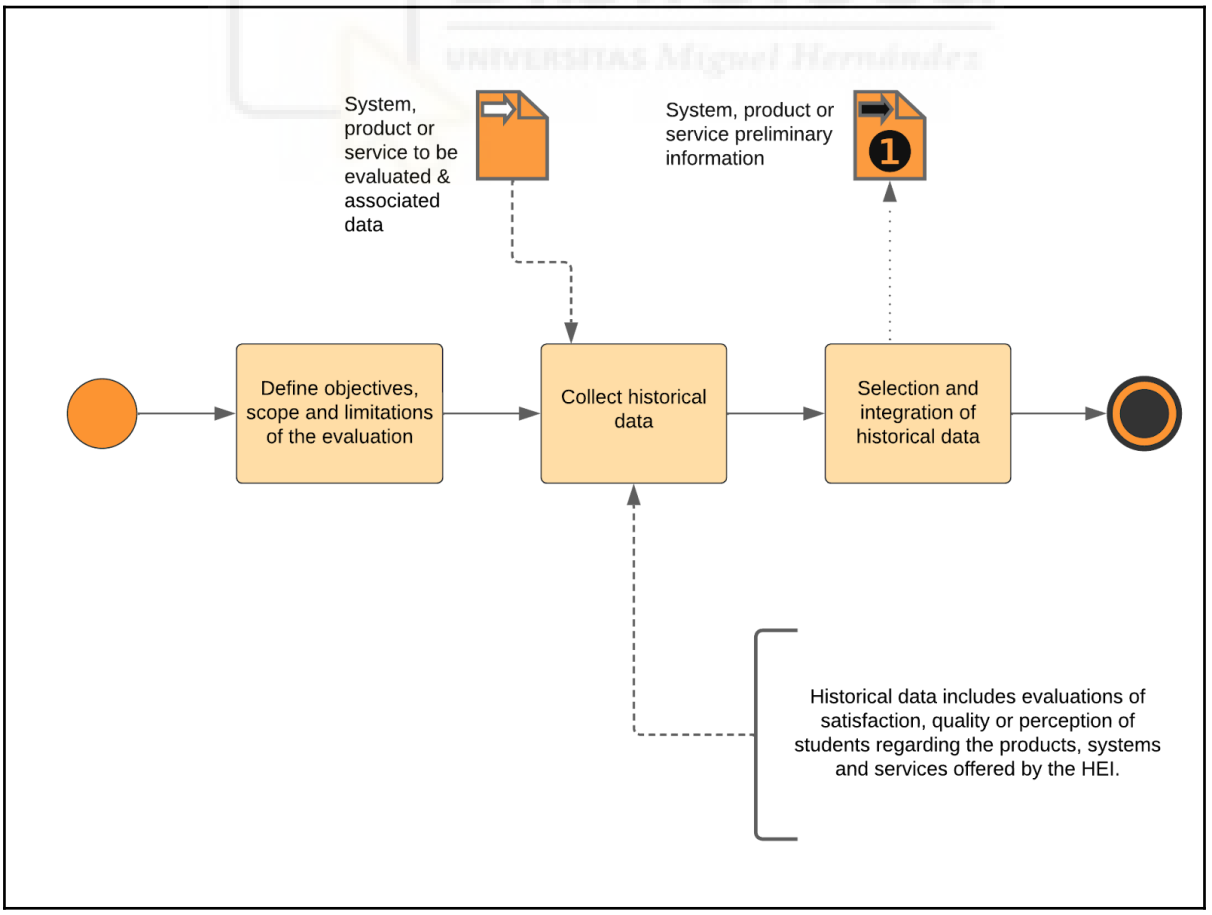

Figure B. BPMN Diagram - S0.1 Data Collection Substage.

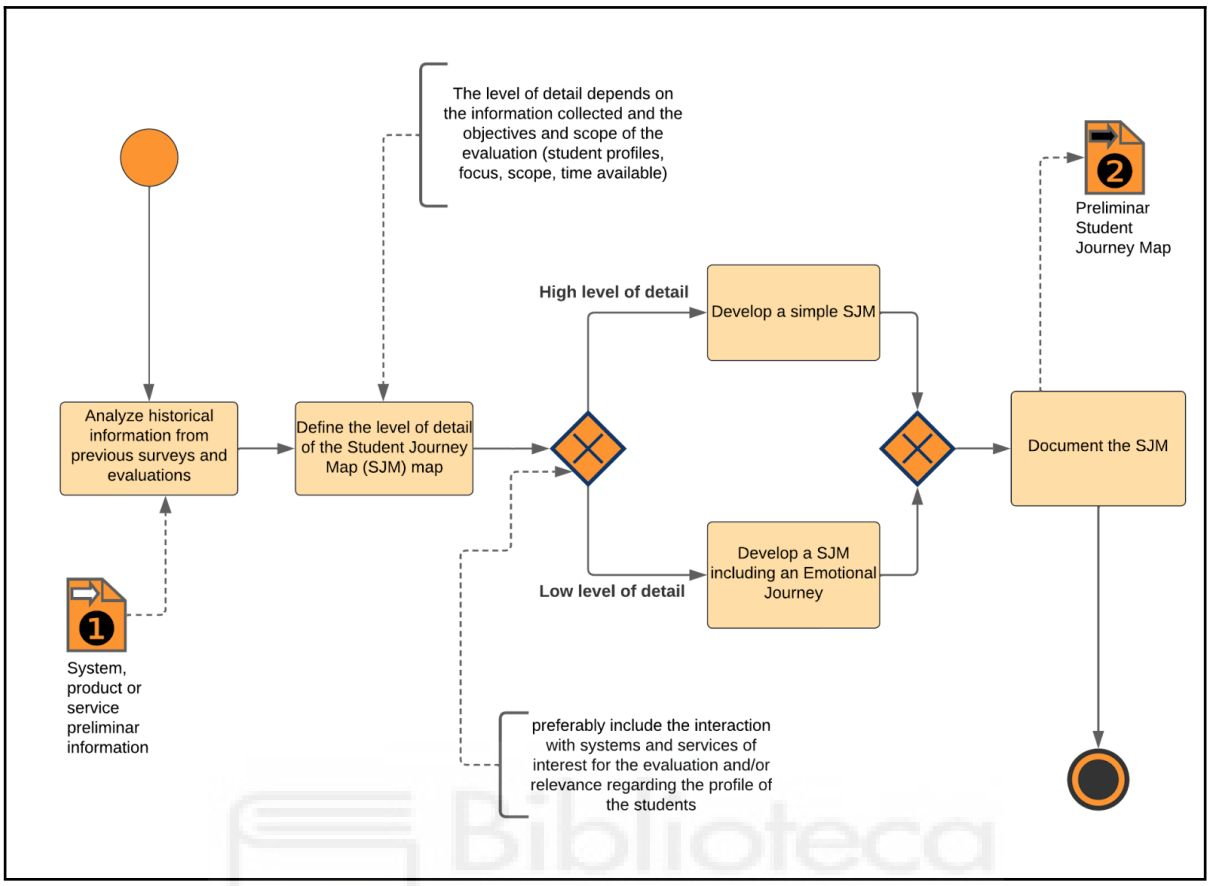

Figure C. BPMN Diagram - S0.2 Preliminary Mapping of the Student Journey Substage.

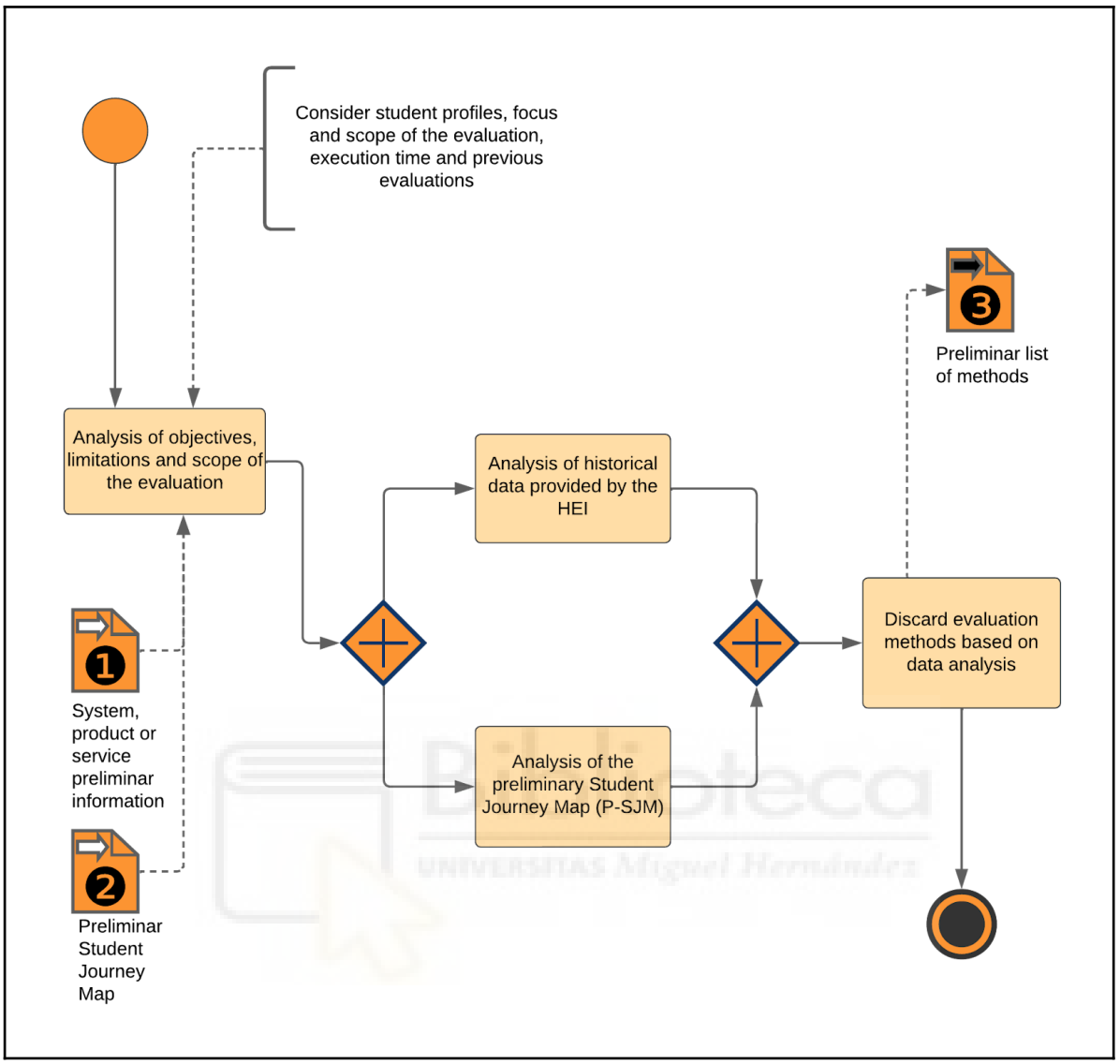

Figure D. BPMN Diagram - S0.3 Preliminary Method Selection Substage.

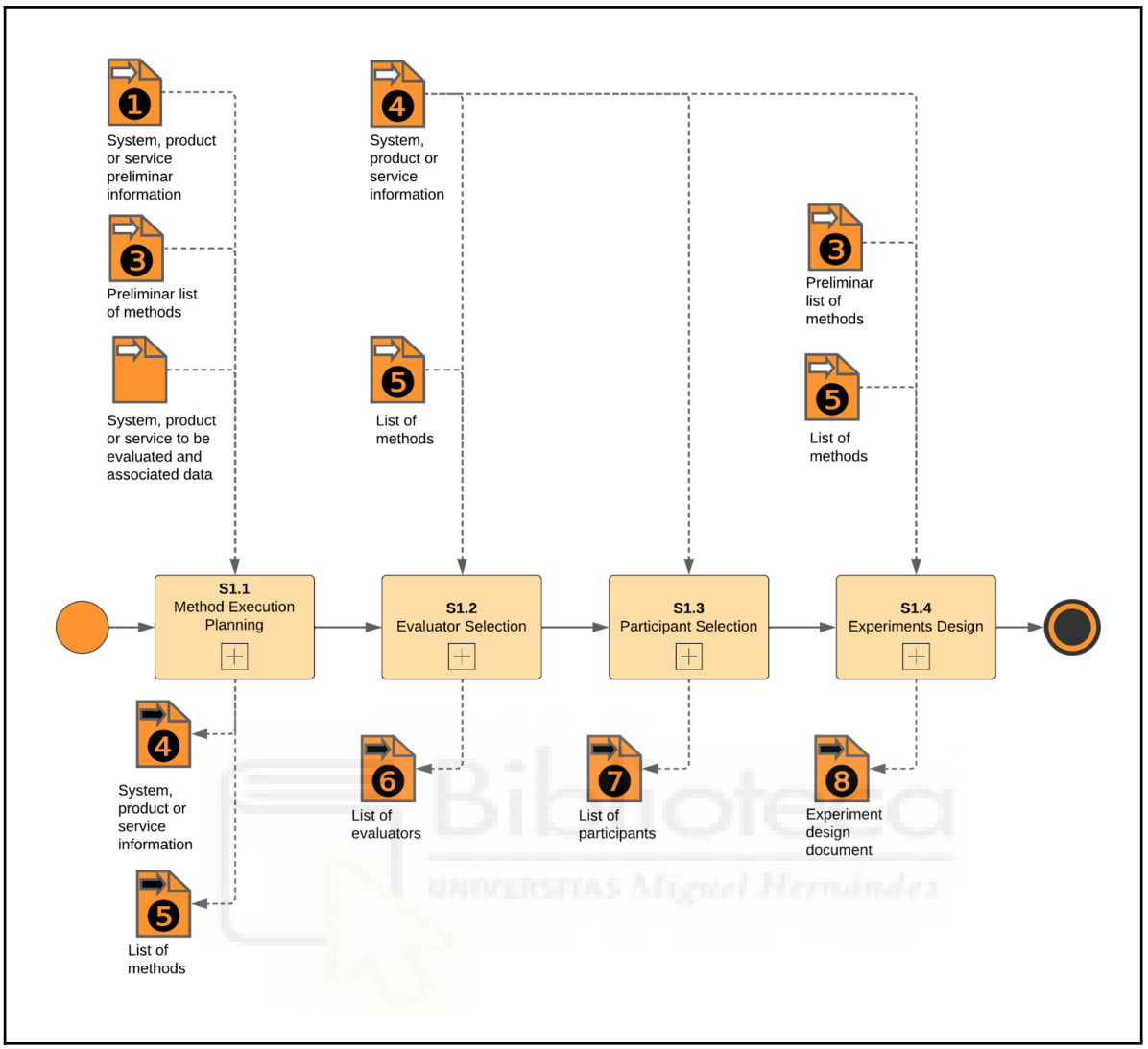

Figure E. BPMN Diagram - S1 Planning Stage.

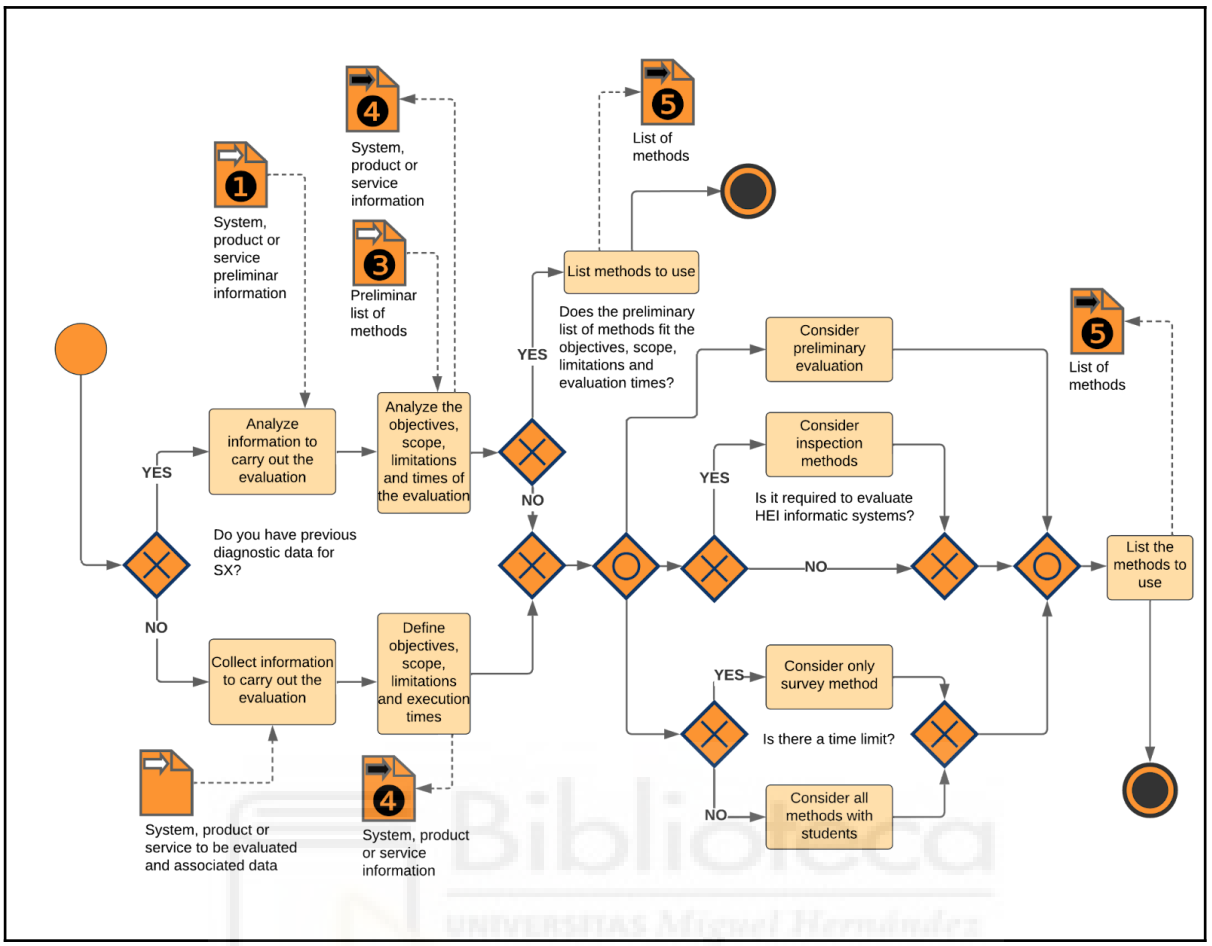

Figure F. BPMN Diagram - S1.1 Method Execution Planning Substage.

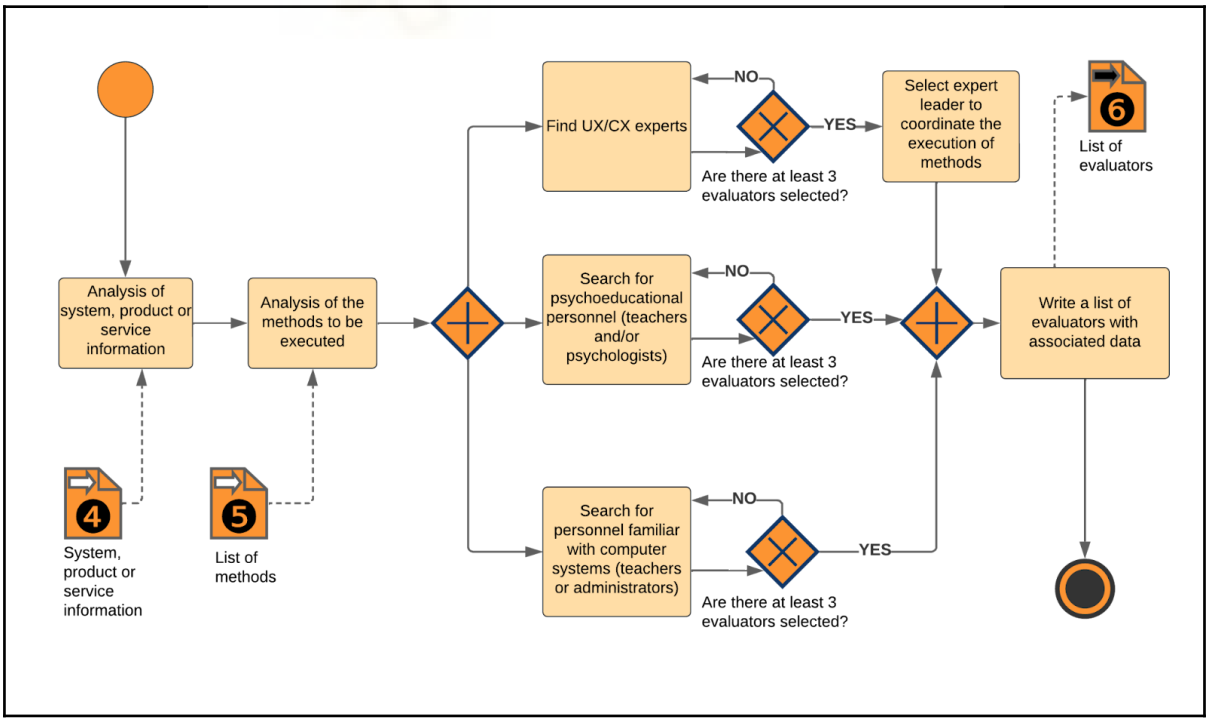

Figure G. BPMN Diagram - S1.2 Evaluator Selection Substage.

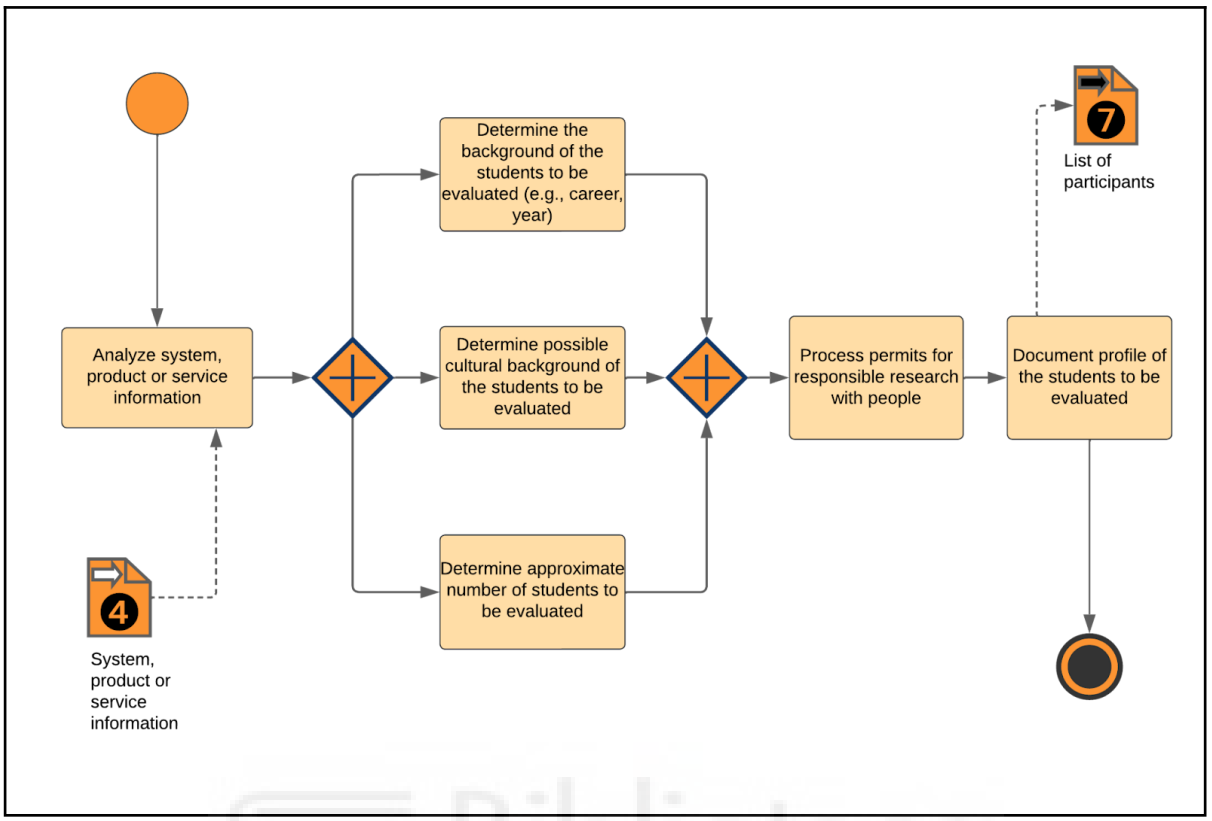

Figure H. BPMN Diagram - S1.3 Participant Selection Substage.

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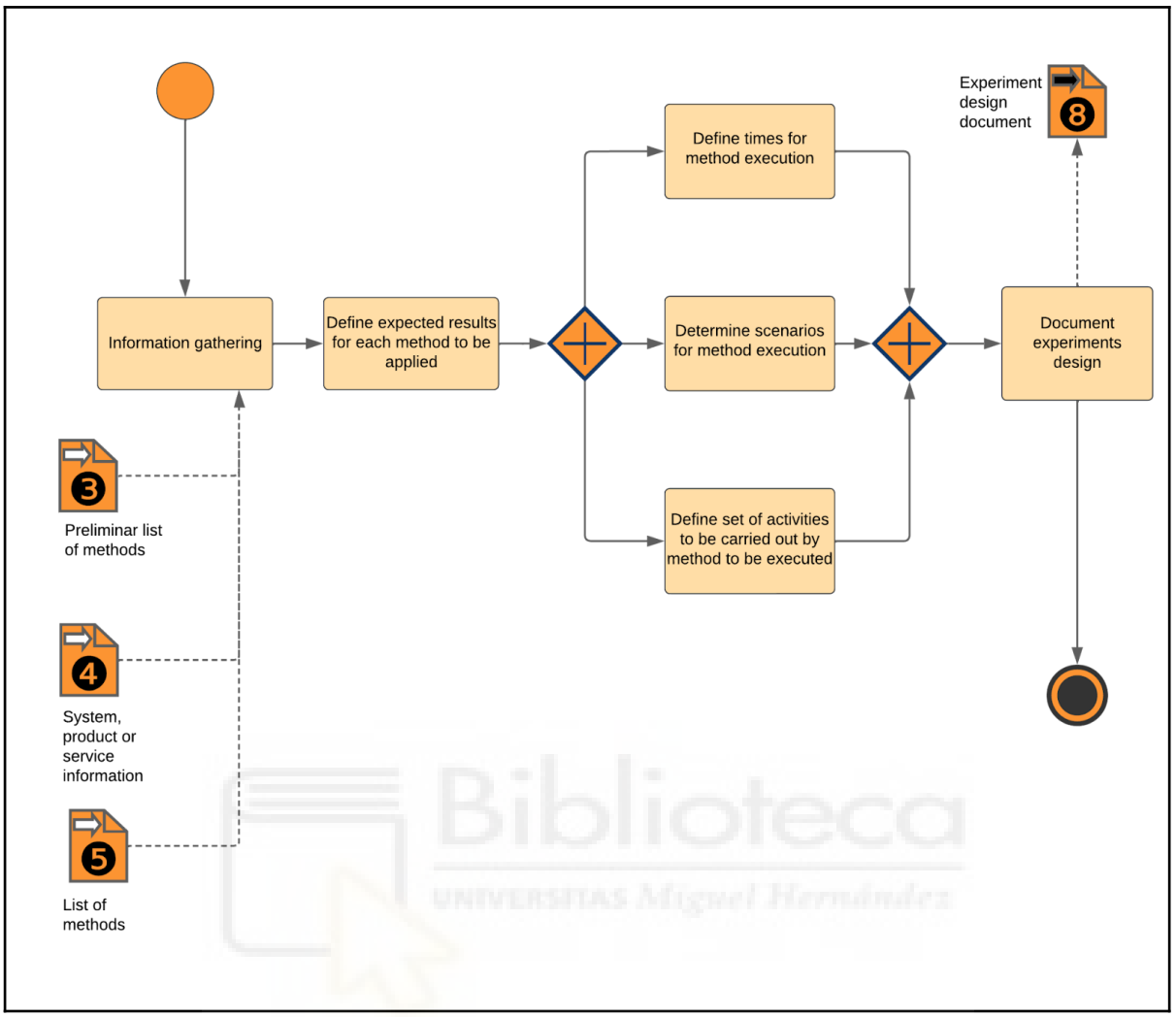

Figure I. BPMN Diagram - S1.4 Experiments Design Substage.

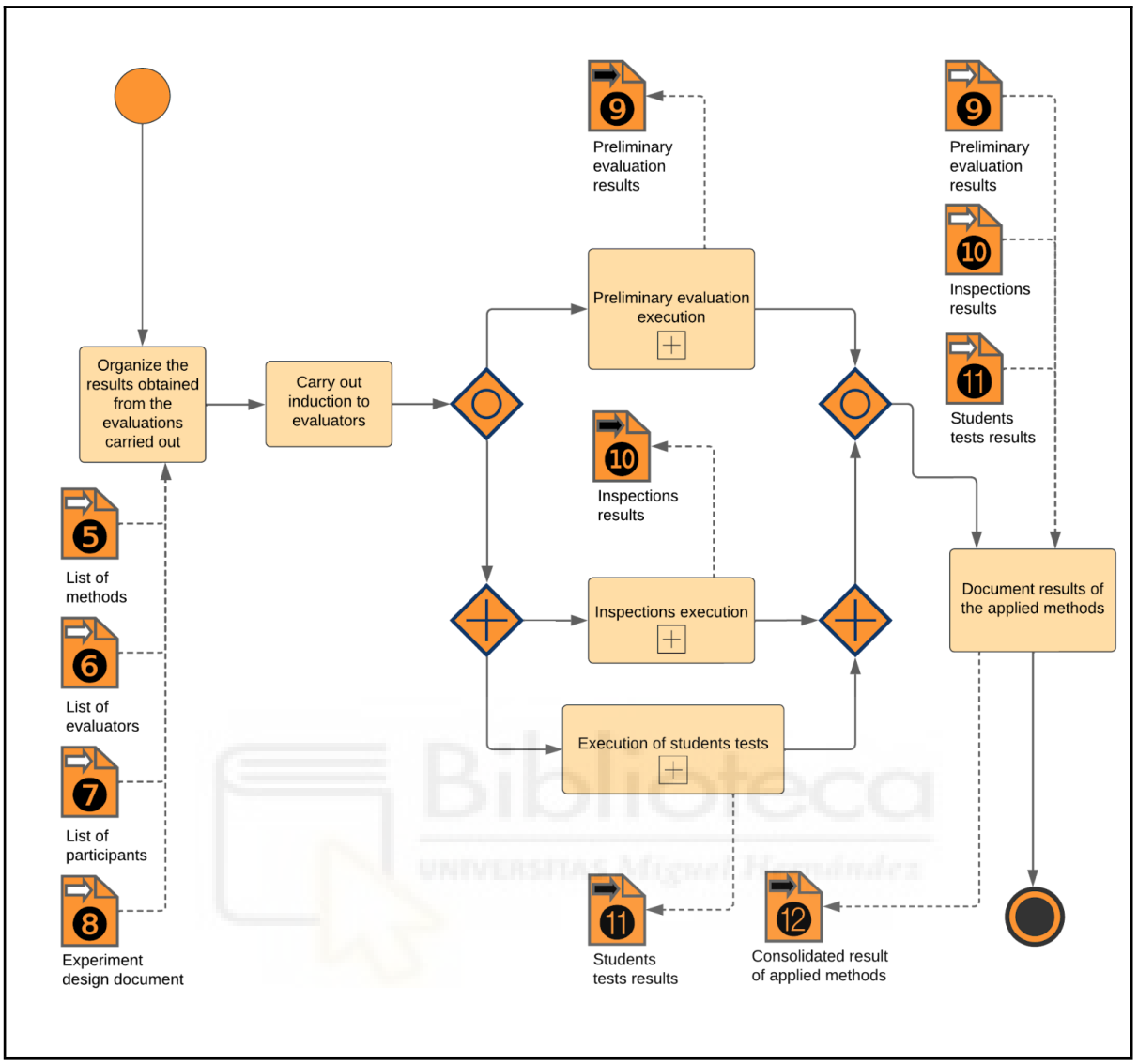

Figure J. BPMN Diagram - S2 Execution Stage.

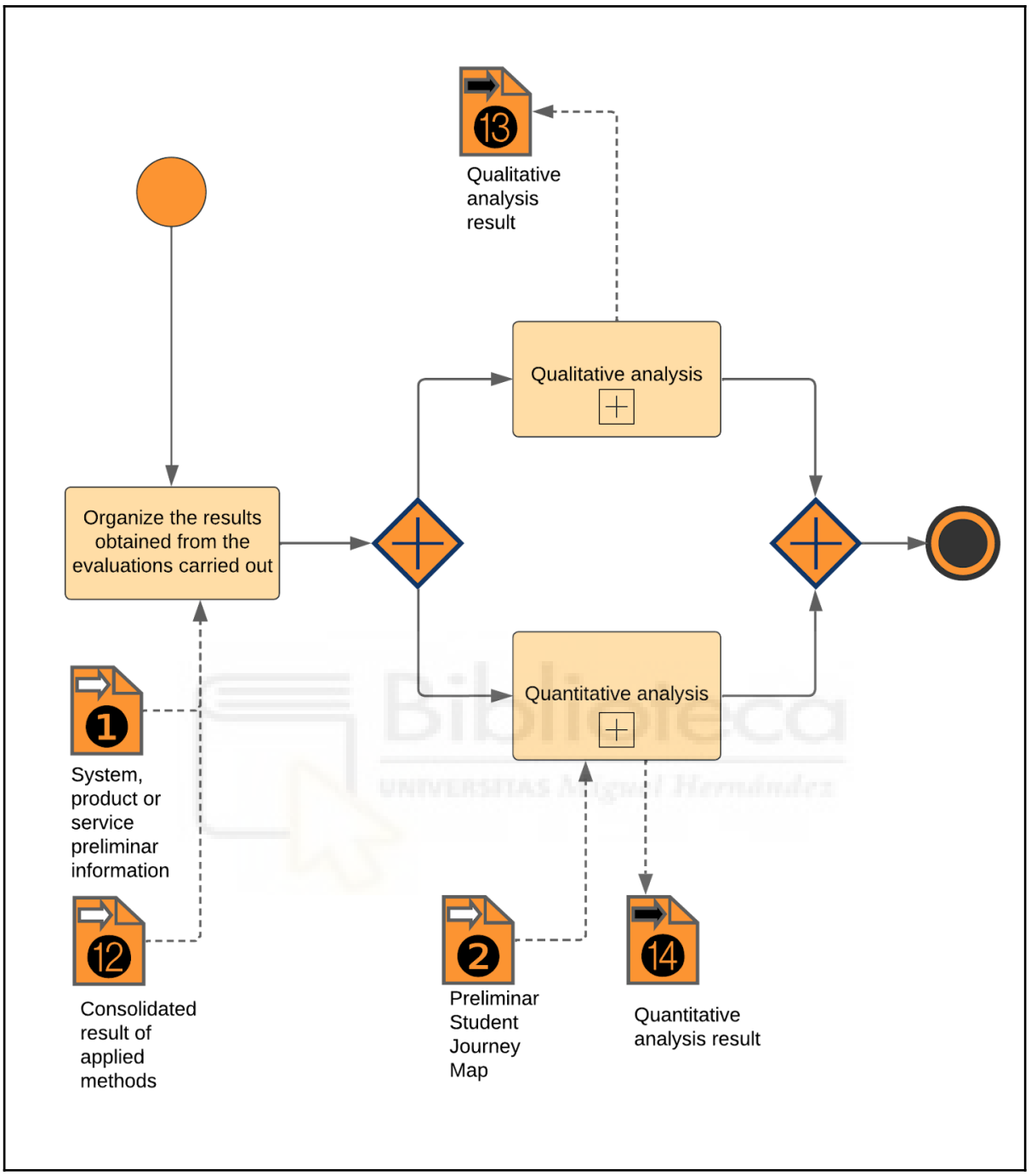

Figure K. BPMN Diagram - S3 Results Analysis Stage.

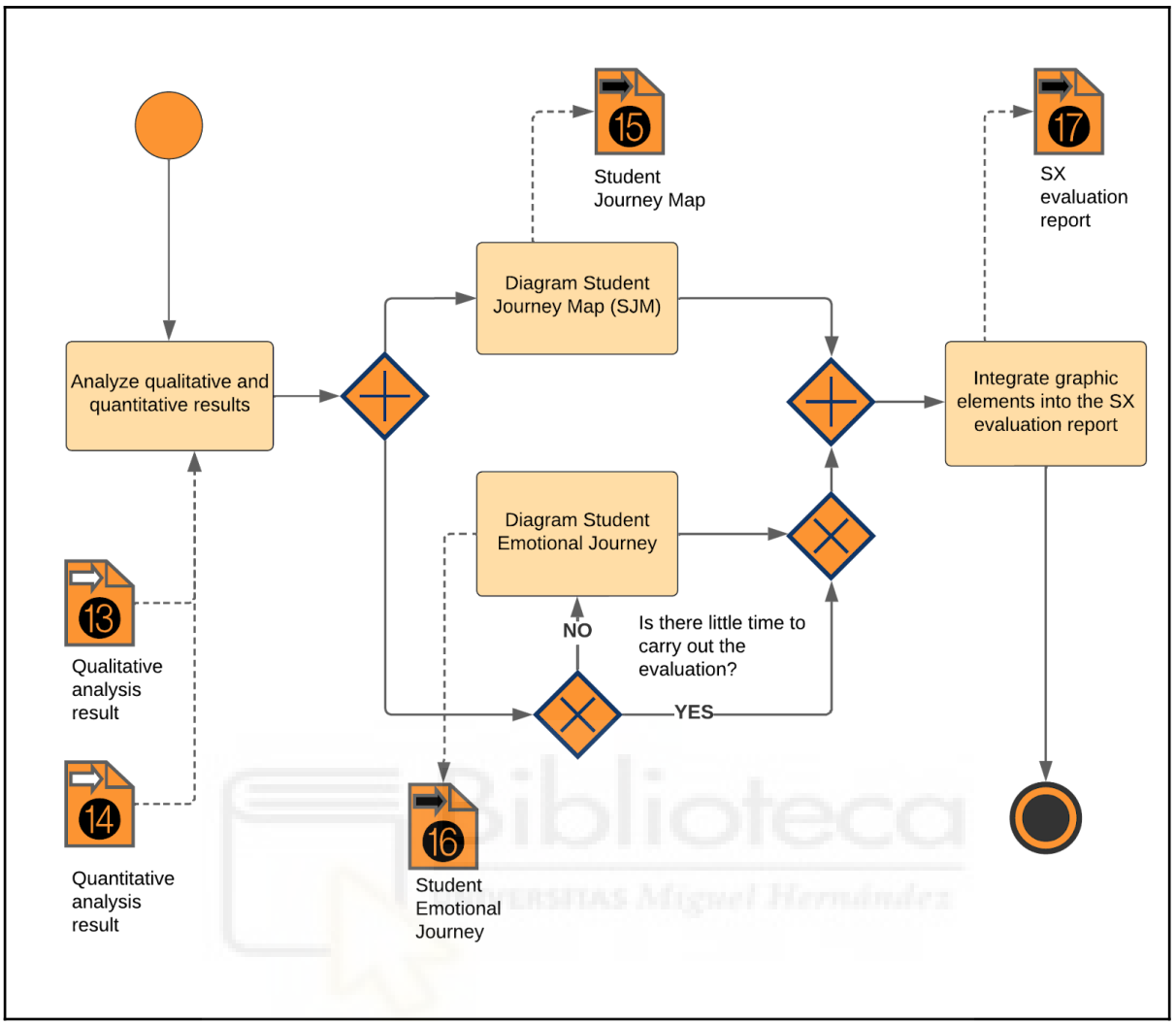

Figure L. BPMN Diagram - S4 Result Interpretation Stage.

APPENDIX C

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applied sciences

IMPACT FACTOR 2.5

CITESCORE 5.3

Article

Student eXperience: A Systematic Literature Review

Nicolás Matus, Cristian Rusu and Sandra Cano

Special Issue
ICT and Statistics in Education

Edited by
Prof. Dr. Jenny Pange and Dr. Zoi Nikiforidou

MDPI

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applied sciences

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Article

Student eXperience: A Systematic Literature Review

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Abstract: Students' experiences have been covered by a large number of studies in different areas. Even so, the concept of student experience (SX) is diffuse, as it does not have a widely accepted meaning and is often shaped to the specific purposes of each study. Understanding this concept allows educational institutions to better address the needs of students. For this reason, we conducted a systematic literature review addressing the concept of SX in higher education, specifically aiming at undergraduate students. In this work, we approach the concept of SX from the perspective of customer experience (CX), based on the premise that students are users of higher education institutions' products, systems and/or services. We reviewed articles published between 2011 and 2021, indexed in five databases (Scopus, Web of Sciences, ACM digital, IEEE Xplore and Science Direct), trying to address research questions concerning: (1) the SX definition; (2) dimensions, attributes and factors that influence SX; and (3) methods used to evaluate the SX. We selected 65 articles and analyzed various SX definitions, as well as scales and surveys to evaluate SX, mainly relating to satisfaction and quality in higher education. We propose a holistic definition of SX and recommend ways to achieve its better analysis.

Keywords: student experience; customer experience; higher education

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1. Introduction

The satisfaction of people's needs is undoubtedly an element of vital importance for the consolidation of a brand or company in the market. This may become even more complex when considering the perceptions of customers that interact with an organization. Customer experience (CX) refers to people's expectations, emotions and interactions with a brand through systems, products, and services, and should be a priority in the market; it has been pointed out that its proper administration can lead to a differential advantage for service organizations [1].

CX requires observing the interaction between a customer and a brand, which is done through the contact points between them. Touchpoints are the instances in which the customer comes into contact with an organization throughout the whole customer "journey". These touchpoints can be both physical and logical. Touchpoints consider communication devices and channels, as well as tasks performed by customers [2].

When we think that students consume products and services, in addition to interacting with university software systems, the relationship between CX and student experience (SX) becomes evident. Students are a particular case of customers in the field of education. For this reason, it is possible to construct a definition of SX from the perspective of CX.

We have performed a systematic literature review of studies published during the past 10 years, from 2011 to 2020 (until June 2021), to identify SX definitions, factors that influence SX, and SX evaluation methods. In doing so, we focused specifically on undergraduate students. We have searched for articles that include "student experience" and "higher education" or "undergraduate" in their metadata (title, abstract and keywords) within five databases: Scopus, Science Direct, IEEE Xplore, Web of Science, and ACM Digital Library. A variety of SX definitions have been found. The results show that there are various scales

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and surveys to evaluate SX. Furthermore, it is clear that SX is often evaluated in terms of satisfaction. As there is no generally agreed SX definition, we propose a holistic approach from a CX point of view.

The remainder of this paper is organized as follows. Section 2 introduces the theoretical background of this study. Section 3 presents the research method, research biases, research questions, search strings, exclusion and inclusion criteria, and a quantitative analysis of the results. Section 4 presents the selected studies, the results obtained, and answers to the research questions. In Section 5, we focus on answering the research questions, expressing our point of view. Finally, in Section 6, we present the conclusions of the review and propose an SX working definition.

2. Background

2.1. User Experience

User experience (UX) is the result of subjective perceptions of the use of goods and services in a given context. The ISO standard 9241-210 defines UX as follows: "person's perceptions and responses resulting from the use and/or anticipated use of a product, system or service". UX incorporates elements such as emotions, personal beliefs/preferences, perceptions, physiological/psychological responses, behaviors and the achievement of activities that occurred before, during, and after the use of a product or service [3]. UX is a concept closely related to CX, which extends the analysis of user interactions with a single product, system, or service to all interactions with a brand, through the products, systems and services that it offers. In this way, the concept of the user gives rise to the concept of the customer. The concept is relevant in our study given that, as a client, students are the users of services, products and systems offered by higher education institutions (HEIs).

2.2. Customer Experience

Although the term CX has been widely discussed, it does not have a clear, standardized definition. CX has been considered as "the physical and emotional experiences occurring through the interactions with the product and/or service offering of a brand from point of first direct, conscious contact, through the total journey to the post-consumption stage" [4].

Gentile et al. (2007) consider that CX has six dimensions: emotional, sensorial, cognitive, pragmatic, lifestyle and relational [5]. The emotional component involves the affective system, through the generation of moods, feelings, and emotions. The sensorial component involves stimulation, which affects the senses. The cognitive component is involved in thinking and conscious mental processes. The pragmatic component is involved in the practical act of doing something. The lifestyle component is related to the values and the beliefs of a person, and the adoption of certain lifestyles and behaviors. The relational component involves the person, social context, and relationships with other people.

Other authors such as Lemon and Verhoef, have defined CX as "a multidimensional construct focusing on a customer's cognitive, emotional, behavioral, sensory, and social responses to a firm's offerings during the customer's entire purchase journey" [6]. This definition makes it clear that the relationship between customers and companies exceeds the threshold of merely physical. Additionally, it mentions the concept of a customer's "journey", which is of great importance when analyzing CX.

Touchpoints are vital elements for analyzing customer's journeys. They have been defined as a representation of: "(. . .) a specific interaction between a customer and an organization. It includes the device being used, the channel used for the interaction, and the specific task being completed." [2].

2.3. Student Experience

Considering that higher education students constantly interact with products, services and systems provided by educational institutions, their role as customers is evident. Thus, for the purposes of this work, we refer to SX as a particular case of CX, where students are customers of educational services, systems and products.

By understanding the dynamics of student interactions and their impact, it is possible to enhance the quality of their experiences and improve their satisfaction and wellbeing. To achieve this, it is necessary to identify the elements/dimensions/factors that compose the SX. In addition, it is important to know that HEIs are trying to evaluate SX.

One of the objectives of this systematic bibliographic review is to know precisely what definitions of SX have been adopted in the literature, as well as the factors and dimensions with which they have been developed.

3. Research Method

This literature review was performed based on the framework for literature re- view in software engineering proposed by Kitchenham [7], which includes the following three phases:

- Planning the review, which includes the process of defining research questions and strategies to carry out the review.
- Conducting the review, which includes the specification of inclusion/exclusion criteria, data extraction and article selection.
- Reporting the review, which requires the presentation and discussion of the results.

To ensure the quality of the review, we have incorporated the checklist of elements proposed by the PRISMA methodology, focusing on improving the realization of systematic literature reviews and meta-analysis [8].

3.1. Research Questions

We oriented the systematic literature review to the following topics: (1) SX definitions, (2) dimensions/attributes/factors regarding SX, and (3) methods that are used to evaluate SX. Table 1 presents the three research questions (RQ) that guided our study.

Table 1. Research questions used in the review.

ID	Research Questions (RQ)
RQ1	What is (undergraduate) SX?
RQ2	What dimensions/attributes/factors influence (undergraduate) SX?
RQ3	What methods are used to evaluate (undergraduate) SX?

3.2. Literature Search

In this review we examined the literature published within the last 10 years (from 2011 to June 2021), indexed in five databases: Scopus, Web of Science, Science Direct, IEEE Xplore, and ACM Digital Library. In all five databases we searched for the following keywords: “student experience” and (“higher education”) or “undergraduate”. The number and percentage of studies available in each database are listed in Table 2.

Table 2. Search results in databases using the keywords.

Database	Number of Studies	% Studies
Scopus	3114	71.1%
Web of Science	800	18.3%
Science Direct	390	8.9%
IEEE Xplore	59	1.3%
ACM Digital Library	15	0.3%
Total	4378	100%

3.3. Study Selection Criteria

We searched for studies focusing on SX, in all areas, including all types of research methods. The inclusion criteria are presented in Table 3. As indicated in the table, the study was limited to SX in higher education, at the undergraduate level, excluding highly

technical applied cases (such as the analysis of the student's experience in highly specialized work environments), and strictly pedagogical articles. This is because SX integrates multiple elements of the student's life (such as culture, emotions, education, commitment), and, therefore, should be approached from a holistic perspective.

Table 3. Study selection criteria for this review.

ID	Category	Criteria
IN1	Inclusion	Articles published between 2011 and 2021
IN2	Inclusion	Articles referring to research questions
EX1	Exclusion	Studies focused on levels other than undergraduate
EX2	Exclusion	Strictly pedagogical articles
EX3	Exclusion	Highly technical applied cases

Given the relevance of some articles referenced by those selected, we decided to also include them, despite not meeting the search criteria expressed in this review.

3.4. Study Selection

By applying the selection criteria, we gathered 65 studies. Figure 1 shows the search and selection process flow, applying the inclusion and exclusion criteria in each step, and removing duplicates.

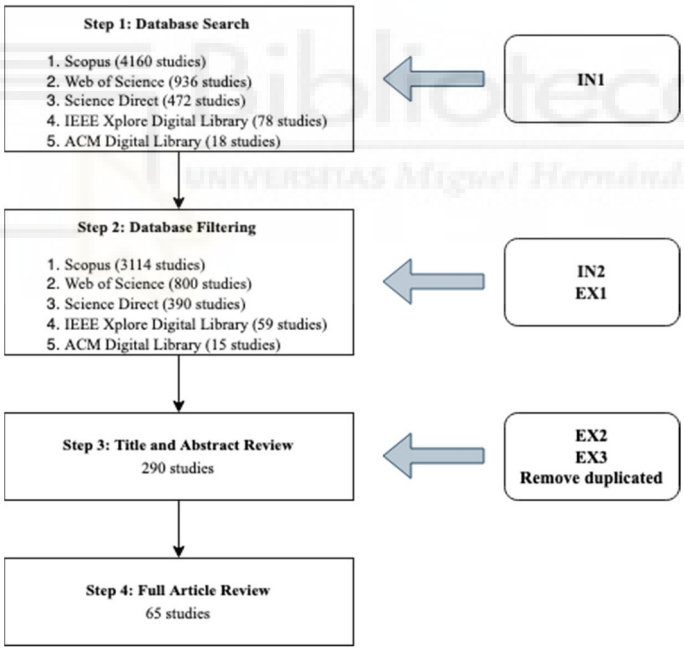

Figure 1. Flow chart with the results of the study selection process.

4. Data Synthesis

The review includes the data synthesis of the 65 studies selected for a full review. This analysis consists of the summarization and tabulation of the studies, identifying: (i) publications over the years, (ii) document type, and (iii) subject area.

4.1. Year of Publication

The distribution of documents published over the years shows continuous growth. This highlights the increasing interest in the research on SX. Additionally, Figure 2 shows that, although the year 2021 is in progress at the time of this review (June 2021), it is possible to forecast that the increasing trend will continue.

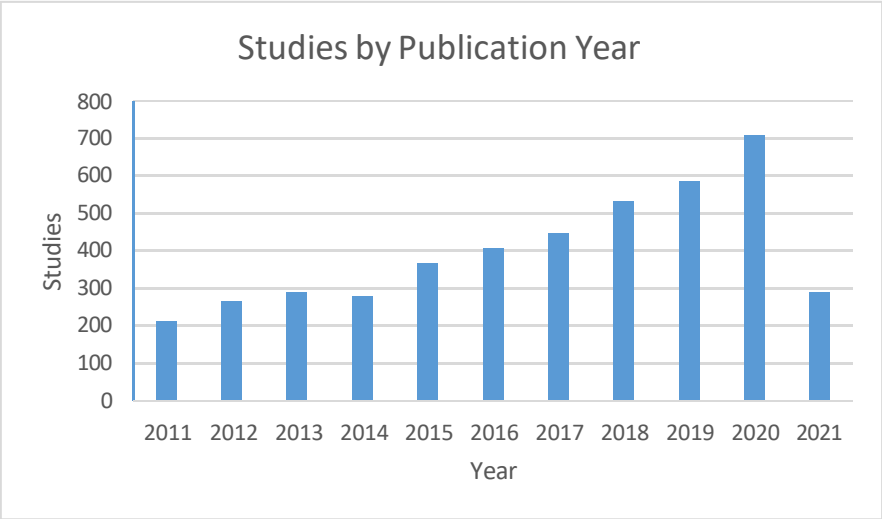

Figure 2. Studies published by year.

4.2. Document Type

We analyzed the document types of the studies reviewed. Documents are classified into books, book chapters, reviews, conference papers, and journal articles. The vast majority of the 65 studies selected were journal articles (53), followed by book chapters (6), conference papers (3), and reviews (2). Books had the smallest number of documents (1). Figure 3 shows the document type distribution of selected studies.

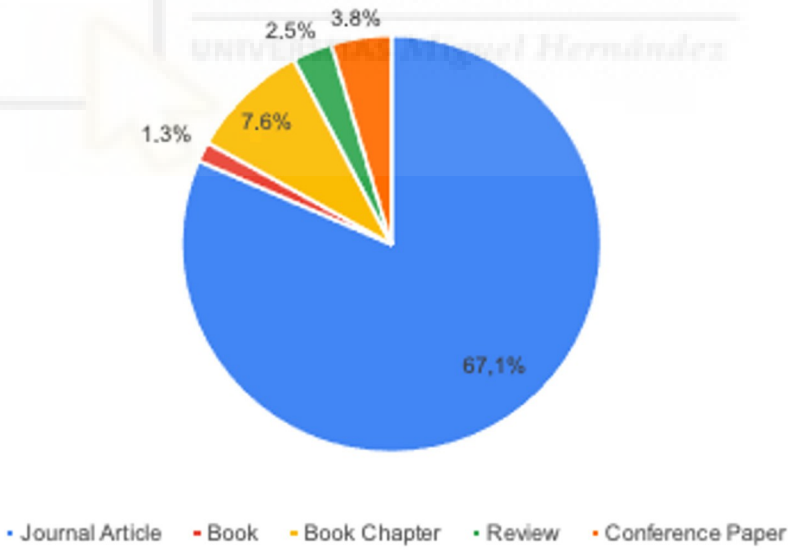

Figure 3. Document type.

4.3. Subject Area

Figure 4 indicates the distribution of the selected studies according to their subject area; the six subject areas are the ones that databases are using when categorizing the documents. The vast majority of studies are in the area of "Social Sciences" (40), while the areas with the smallest number of studies are "Tertiary Education and Management" (1), and "Education/Educational Research" (1). We point out the importance of the considerable number of studies with a multidisciplinary approach (19), which highlights the need for a multisectoral approach to SX.

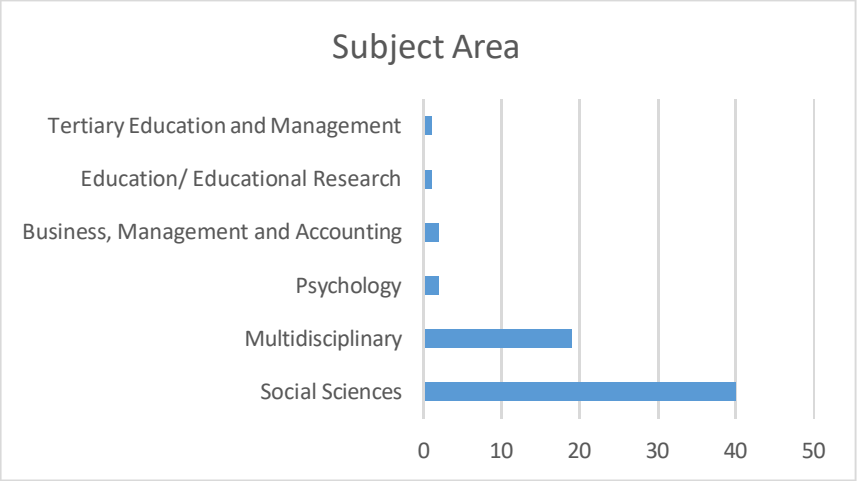

Figure 4. Studies subject area.

5. Answering the Research Questions

5.1. RQ1: What Is (Undegraduate) SX?

The SX concept is relatively new [9]. The concept emerged driven by a fundamental change in the higher education sector, where teaching centered on the student and oriented toward learning processes began to be prioritized. However, over the years, SX has been defined in multiple ways [10]. This is not a minor conceptual problem.

Tan et al. pointed out inconsistencies when defining the SX concept [11]. The "experience" definition is, on the other hand, diffuse and, in many cases, the term is, "as the concept of value", rarely well defined [12–14]. Despite the problems of inconsistency, the SX concept makes a clear reference to the experiences of students. Even so, it is sometimes dif- ficult to distinguish between such experiences and students' everyday life experiences [15]. SX has become a topic of great interest, especially in the past decade (2010's), in academic and learning environments [16]; very few studies have focused on the students' holistic experiences [17].

This concept has been widely used in universities for advertising purposes. In this way, universities offer an "excellent student experience" in order to attract consumer/students [18]. SX shows a trend in the use of the concept as an indicator of quality and/or satisfaction. Authors such as Farhan and Carey have pointed out that, since the focus of HEIs is on student satisfaction, it is possible to observe consumer attributes in students [19,20].

Since the emergence of the concept, it has been referred to as a strictly pedagogical field. This has changed over the years. Baranova et al. have observed how the conception of the student experience has evolved, including, in addition to the learning and teaching experience, the interaction of students with the administrative and support services of HEIs, outside the classroom [21]. Douglas et al. defined SX within the academic sphere as the "experience of higher education teaching, learning and assessment and their experience of other university ancillary service aspects" [22]. Other examples of the definition of the concept outside the classroom are those of Harvey and Knight, and Arambewela and Maringe, who use the term "total student experience" to refer to experiences lived by students in contexts broader than the physical place of learning [23,24].

It is important to point out that the learning experience, being related to the learning outcomes of the students, directly influences students' academic success. Kahu et al. also observed how the academic success of students, as well as the awareness of that feeling, influence student engagement, as well as other factors that we have covered in this section [25].

Pötschulat et al. analyzed the SX concept from a sociological point of view. They concluded that the use of the concept tends to be a political intervention, in view of its sociological inadequacy. They also point out that the use of the concept smuggles in a

market logic that homogenizes the elements in which it could be composed [26]. We believe that not only a poorly focused market logic can homogenize the elements of the student's experience, but also any superficial approach to the concept. The blurring of the elements that compose SX can make it difficult to evaluate.

Detaching the concept from the academic field, Baird and Gordon have said that the SX concept refers to the various experiences of subjects while they are students. Similarly, Temple et al. defined SX as the totality of a student's interaction with the institution, contemplating the interactions carried out outside the merely academic field [27,28]. Rahim and Jusoh mentioned that the term SX refers to the "student learning and living development at higher educational institution starting from early admission to the university until graduation" [29].

The trend towards a broader approach to the SX concept is evident when we observe new concepts that involve experiences in different contexts. An example of this are the terms "student transitions" [30,31], "trajectories" [32] or "pathways" [33], which make clear reference to the students' journey.

Despite the focus on teaching and learning in which SX has been addressed, there is evidence in the literature that focuses on students as customers [34–37]. Within the less typical views in the market, students have been analyzed as active customers [38], citizens [39], and coproducers [40,41]. In this way, the active role of students comprises student–academic collaboration relationships for the production of knowledge, and student–society relation- ships, where the student is analyzed as part of society and the relationship of convenience between them is ethically analyzed. Part of the research carried out in this matter has addressed a vision of the education market dealing with the discourse of the value of cocreation, where students contribute their capacities to the construction of the educa- tional system [42–45]. This point is important because, as a result of the interaction of students with HEIs, it is possible to create value. This highlights the mutual benefits of the student–HEI relationship. The value of cocreation by the customer has been analyzed by Prahalad and Ramaswamy, and identified as the experience of a specific customer, at a specific point in time and location, in a specific interaction context [46]. As a result of students' value creation, their role as a customer is once again evident. Gupta and Vajic have related customers' experiences with the knowledge acquisition process, saying that "an experience occurs when a customer has any sensation or knowledge acquisition resulting from some level of interaction with different elements of a context created by the service provider" [47].

It should be noted that there have been criticisms of the public policies that have introduced a market logic into education and have placed the student as a mere customer [48,49]. Research that criticizes market logic focuses on two aspects. First, the impact of new management practices on academic work and identity [50–52]. Second, the negative impact on students' expectations and experiences, since there has been a transition from student to learner, where they are pushed to take responsibility for their own learning as independent, self directed individuals [53–56]. Jæger and Gram analyze the Chinese and Danish exchange student context, pointing out marketization in education approaches; national and transnational discourses, and government and institutional policies are factors that influence consumer orientation among students [57]. The economic model by which HEIs are financed does not only include the factors that affect consumer orientation.

For us, and like Dollinger and Lodge, the large quantity and variety of definitions of the SX concept denotes an evident diversity of the conceptualization of experience in higher education [58]. This undoubtedly represents a problem, considering that in the literature a direct relationship between SX and student satisfaction is made, and satisfaction is pointed out as an indicator of quality in HEIs [23,59], understanding satisfaction as the positive difference between expectation and perceptions. In this way, it is possible to see how various evaluation mechanisms (such as SERVQUAL and National Student Survey (NSS)) have been used to assess SX, which, according to multiple authors, is not sufficient or adequate for this task, in determined contexts.

Table 4 indicates the different approaches to the SX concept and the associated studies.

Table 4. Studies approaches to the SX concept.

Approach	Studies
Academic	[16,21–25,29]
Student Journey	[30–33]
Sociological	[26]
Holistic	[15,17,23,24,27,28,58]
Customer	[18–20,34–41,43–45,48,57]
Market Logic	[48,50–57]
HE Quality	[23,59]

5.2. RQ2: What Dimensions/Attributes/Factors Influence (Undegraduate) SX?

The concept of SX is treated in a wide number of studies using different approaches, depending on the specific goals of each research. As Mieschbuehler mentioned "the term student experience can be found everywhere" [18]. In addition, a predominant approach to learning and teaching was observed, focusing on the student learning experience and learning outcomes.

After conducting an exhaustive analysis of the studies in the literature, we can indi- cate that the studies usually focus on three topics: (i) on learning and teaching, where the methodological and technological aspects that allow increasing learning outcomes and facilitate teaching are analyzed, including evaluative processes; (ii) on engagement/commitment, where the sense of belonging, partnership and engagement/commitment between the students and the HEI are analyzed; and (iii) on the wellbeing of the students, where the sensations and feelings of the students are analyzed, as well as their overall wellbeing and interpersonal relationships. This is similar to that observed by Bista, who mentions that the perspectives of international students' experiences include sociocultural identities, contextual influences on their learning experiences, their wellbeing experiences, and their poststudy experiences [60]. Bates et al. have identified main themes referring to students' experiences, such as "Learning Environment", "Work–Life Balance" and "Wider University Community" [10].

Kahu and Picton have analyzed first year students' experiences using photo elicitation. They analyzed the information provided by the students thematically and categorized it, focusing on three dimensions of their experience: life, university and learning [61]. Other authors have highlighted the use of surveys focused on students' experiences, such as the Australian Student Experience Survey (SES) [62,63]. This survey categorizes its questions into five conceptual groups related to satisfaction: learner engagement, teaching quality, learning resources, student support, and skills development [64]. Additionally, a study by Hong et al. analyzed the trends in which the student experience was ad- dressed. These trends are "First-year transitions", "Student engagement and outcome", "Student experience in learning", and "Quality management and service satisfaction", among others [65]. Tan et al. realized, through a literature review, the prevailing research streams when speaking of "student experience". These are "exploration of learning experi- ence", "exploration of student experience", "gender differences in assessment of higher education experience", "improvement in quality of student experience", and "student satisfaction with higher education experience" [11].

Hailikari et al. observed that the focus on learning and teaching in SX is the most common, generally referring to strictly academic environments and factors. For good reason, they mention that the experience of the students is affected by more factors [66]. Furthermore, student learning experience in HEIs is also a multifactorial issue that is affected by environmental variables, such as the HEI's infrastructure, classroom quality, residential facilities, IT facilities, and sports facilities [67]. Ruhanen et al. analyzed students' experiences in a tourism immersion internship. In their work, it was observed how the

expectations, experiences and satisfaction of the students are directly related to their learning experience [68].

From the point of view of technological support, Barret et al. addressed the role that learning technologies and learning management systems play in improving students' experiences. This is evidenced in the learning outcomes of students [69]. Likewise, Yu and Bryant analyzed the use of technology in the learning experience of students, and the consequent impact on their lives. Although the impact of technology on SX and on learning outcomes is notable, the lack of studies linking these elements is evident. As Yu and Bryant said "we know little about how students' personal, digital and educational lives intersect and shape their learning experience" [70].

The prevailing focus of teaching and learning on student experience has led to the development of tools that can increase student satisfaction. This is the case of the User eXperience Design for Learning Honeycomb framework, which aims to create valuable online learning experiences. Troop et al., analyzed the use of this framework and detected four aspects in the online platform's design that students find valuable: accessibility, usefulness, intuitiveness, and desirable [71].

There are surveys that allow us to get notions about the learning experience of students, more specifically, their learning outcomes. Douglass et al. used, in their study, the Student Experience in the Research University Survey (SERU-S), which allows accountability for assessing and reporting learning outcomes in higher education [72].

Students' engagement in relation to students' experiences is one of the most frequently observed themes in the literature regarding SX. Student engagement has been associated with other elements of SX, such as student learning and achievement [73]. Studies carried out with the Student Experiential and Engagement Value Index (SEEVI) have made clear the close relationship between students' engagement with HEIs, and their experience [74]. Student engagement is influenced by many factors, such as sense of belonging, institutional commitment, student satisfaction, and the quality of the students' experiences [75]. Chambers and Chiang have used the National Survey of Student Engagement (NSSE) to analyze students' perceptions about the issues that challenge them to develop skills, awareness, confidence, and other factors that influence their engagement. The close relationship that exists between engagement and the experience of students is evident [76].

Meehan and Howells analyzed the impact of students' experiences in HEIs and their sense of belonging. In their work, they concluded that "the students' states of being, belonging and becoming are critical to understand in order to engage students for a successful experience in higher education" [77]. It is evident that the sense of belonging and the engagement of the students are closely linked, and that sense of belonging plays a vital role in the wellbeing of the students. Similarly, Naylor et al. highlighted the importance of students' sense of belonging while reducing their stress levels, to improve their experience. This also reduces the risk of dropping out [78]. Other authors directly relate student retention with increasing students' satisfaction by improving their experience [79].

Both sense of belonging and workload stress have been validated, together with feeling supported and intellectual engagement, as elements that serve to evaluate the experience of students. In this way, the crucial role that the affective aspects of students have, in terms of the quality of their experiences, is revealed. In addition, student engagement has been related to student happiness, which has implications for students' experiences and overall wellbeing [80].

Grebennikov and Shah, monitoring trends in student satisfaction, have realized the importance of satisfaction in student engagement. If students had good and satisfactory experiences, they were more reluctant to drop out of their studies. In this way, the relation- ship between the wellbeing of students and engagement is evident, which is one of the focuses most approached in the literature regarding SX [81].

Dominguez-Whitehead has analyzed the role of nonacademic support services in SX, considering that students' experiences extend beyond the academic context. The analysis of nonacademic services is related to personal, institutional, and interpersonal factors.

Investigating the relationship between students' experiences with nonacademic services can offer alternatives for rectifying problems and concerns related to nonacademic service provision, improving students' experiences and wellbeing [82].

Smith and Segbers analyzed the impact of interculturality on students' experiences [83]. This is important, because through good practices that address intercultural education situations, financial, educational, and cultural benefits can be achieved. It is also important to mention authors who have pointed out cultural differences in learning, which certainly affects the perception of quality in HEIs and the experience of the students [84].

Tan et al. observed that gender differences in the assessment of higher education experience is a common research stream in studies that analyze students' experiences [11]. In this way, it is evident that the experience of students is subject to factors specific to individuals, such as their own gender. Similarly, Jayadeva et al. observed that students' perceptions of higher education vary depending on factors specific to individuals and their environment, such as national contexts, and may be mediated by factors such as educational quality perceptions [85].

Another example of student experience assessment under specific contexts is observed in the work of Brady et al., who developed a survey to analyze the perspectives and experiences of STEM (science, technology, engineering, and math) students in historically black colleges and universities (HBCUs) [86]. African American students' experiences in HBCUs can differ significantly from those in other communities, and in other HEIs, considering the racial segregation that has taken place in the USA over the past century. It has been observed that some HEIs outperform others because of the alignment between the values and aspirations of the students with those exhibited by their HEI [62].

It is important to mention that the experiences of students who transition to higher education turn out to be an important factor in terms of their learning outcomes and engagement [87]. As the experiences of first year students have such a significant impact on their perception and academic results, it is possible to explain the large number of studies focused on this group of students [26,61,77,78,88,89].

SX has been addressed in a large number of studies using different approaches. While these approaches are well suited to providing a satisfying experience, and can comple- ment each other, factors unique to the student's life should not be omitted. Cheeseman has considered that the experience of students does not strictly refer to the relationship between students and their HEI, but encompasses aspects of the students' day to day lives [90]. Students' personal experience, familial experience, institutional experience, national milieus, class, ethnicity, gender, race, religion, sexual orientation, or responsibility for dependents, are factors that influence SX [54,91–93].

We share Sabri's critique on the conceptualization of the "student experience" as a means of discriminating between the value of different educational experiences [48]. We believe that this occurs due to the multiple factors inherent to the student's life that are overlooked, either by the surveys or the research approaches.

In view of the studies analyzed in this review, we categorized the factors that influence the student experience into three dimensions. To achieve this, we analyzed the approach of the studies referring to SX, the conceptual groups attended, and the elements considered in evaluation scales that address the subject. The results shown in Table 5 describe the observed dimensions of SX and the factors related to each dimension. In addition, studies related to these factors are included.

Table 5. Student experience observable dimensions.

ID	Category	Criteria
Social Dimension	Community Relationship	[21,58,67,70,82,88,91,94–97]
	Institutional Engagement	[25,60,67,73–79,81,86,88,89,94–96,98–105]
Educational Dimension	Learning Engagement	[17,21,25,29,61,66,67,73–76,78,79,81,86,89,95,104–107]
	Higher Education Quality	[11,24,34,37,58,59,63,76,81,84,98,108–113]
	Learning Resources/ Learning Environment	[10,16,35,62,65,66,69–71,73,75,91,99,105,107]
	Educational/ Support Services	[60,69,78,82,97,102,106,114]
Personal Dimension	Student Development and Outcomes	[17,29,67,72,76,95,114]
	Student Feelings and Emotions	[10,67,70,78,80,95,97,115]
	Environment Relationship	[26,58,76,90,91,95,96,105]
	Student Thoughts, Identity and Background	[10–12,15,17–20,22–24,26–28,30–41,43–45,48,50–58,60–63,65–69,71,76,77,79,81,83–93,95,97,99–102,105–108,114,115]

In the social dimension, we found factors related to the interaction of students with the various actors and entities that provide services in HEIs. This includes relationships with educational staff, HEIs helpdesks, classmates, and tutors, among others. In addition, this dimension includes students' institutional engagement, as this is generated mainly from interactions between entities.

In the educational dimension, we found factors related to the learning experience of students, which determine their learning outcomes and success. In this way, aspects such as teaching quality, learning resources, student educational support and learning engagement are included.

In the personal dimension, we found factors related to aspects of the life of each student. Some factors in this dimension are difficult to evaluate using standardized tools. This dimension includes aspects such as gender, socioeconomic level, cultural background, state of health, emotions, skill development, and day to day experiences, among others. The emotions experienced by students are particularly important, as they affect short and long term adaptational outcomes in higher education [116].

It should be noted that, sometimes, the factors mentioned above do not refer to having an effect on a single dimension of the student's experience but may also affect factors typically associated with other dimensions.

5.3. RQ3: What Methods Are Used to Evaluate (Undergraduate) SX?

Evaluating SX is of growing interest among various governments and HEIs. As a result of efforts to improve student satisfaction, frameworks and scales have been proposed to measure students' satisfaction, and overall student experiences in HE. Otherwise, student experience is typically measured using policy driven metrics [10]. This is the case with tools such as the NSS [117], NSSE [118], SES, Course Experience Questionnaire (CEQ), and variations of the SERVQUAL scale, to evaluate satisfaction with educational services in different case studies. In addition, some tools have focused on engagement aspects, such as SEEVI [63].

All the tools mentioned above have in common the characteristic of gathering opinions directly from students. While this is a positive aspect, it is hardly sufficient. Nair et al. have pointed out the importance of the commitment of the university, faculty management and academic staff to address students' issues correctly [108]. In this way, it is evident that the various mechanisms to evaluate the experience of students must be matched with appropriate measures to effectively improve student satisfaction.

The term "student experience" is usually associated with students' perceived satisfaction. In the words of Meehan and Howells, "measuring student experience in terms of satisfaction is a national measure used by prospective students when considering their higher education choices" [88]. Ammigan and Jones have analyzed the degree of satisfaction that international students perceive in the different dimensions of their university experience. By performing a regression analysis on the data obtained from the students,

they were able to identify four dimensions of satisfaction related to students' experiences: arrival experience, learning experience, living experience, and support services experience [106]. To carry out their study, they relied on the International Student Barometer (ISB), which tracks and compares the decision making, expectations, perceptions and intentions of international students, from application to graduation [119].

Student satisfaction and student experience are often measured in terms of the quality of services or products that HEIs offer to them [94]. Additionally, the quality of the services offered is usually measured in terms of teaching [98,109,110]. In view of the dimensions that we have analyzed in this article, it is evident that a quality approach focused solely on teaching is a mistake.

The relationship between student experience, quality, and satisfaction is more evident when we analyze the relationship between students' experiences and university accredita- tion, carried out by agencies such as the Quality Assurance Agency (QAA) in the UK [111]. Camgoz-Akdag and Zaim have worked with the five dimensions of SERVQUAL as a basis for proposing a conceptual model of student satisfaction. In this study, the quality variables perceived by the students were related to their satisfaction and, thus, to their overall SX [112].

SERVQUAL [120] is one of the most widely used scales to evaluate students' perceptions of the services delivered at HEIs. Even so, this scale does not seem to be efficient in certain contexts, which is why many studies modify this service quality scale depending on their objectives. Vaughan and Woodruffe-Burton tested a disabled user specific service quality model (ARCHSECRET) [113], as opposed to a modified version of SERVQUAL, in the context of disabled students. In practice, this model turned out to be more efficient in the specific case of students with disabilities [114]. For cases such as the previously mentioned, it is valid to assume that it is not possible to develop a single model that is capable of evaluating the perceptions and satisfaction of students, without disregarding elements of their personal lives.

We found several studies aimed at measuring student satisfaction, taking into account rather "unusual" elements. Shahijan et al. have examined the experiences of international students' satisfaction with HEIs. In their work, they focused on measuring the experiences of international students, as well as their satisfaction level and perceived performance [99]. This is a complex task, considering that the international student experience is a multidimensional issue influenced by various personal and cultural factors [91]. Meehan and Howells conducted a study to analyze the perceptions of first year students, regarding students' experiences and satisfaction. For this work, they used the Student Experience Evaluation (SEE) instrument and the National Student Survey (NSS). Their analysis identified three elements that influence the students' experiences and satisfaction: the academic staff they work with, the nature of their academic study, and their sense of belonging [88].

Satisfaction measurement extends to the use of more scales than just SERVQUAL. This is the case in studies that have used the UK NSS, which is very popular [63]. This is usually considered in the student evaluations of teaching (SET) cases of study. However, this survey was also criticized. Zaitseva et al. have used concept mapping software in their studies to aid in the interpretation of the qualitative data from student satisfaction surveys. In this way, they were able to identify aspects of SX beyond the survey questions. In their studies, they have mentioned the importance of being cautious with statements that imply that survey results are representative of the entire student experience [95]. For her part, Sabri criticizes the role of the NSS, arguing that it has nuances that cause the tool to exceed its validity or intended use [96].

Although student experience is usually measured in terms of student satisfaction, multiple governments and organizations do so in terms of the quality of products and services provided by HEIs using quality indicators (e.g., sufficiency of learning resources, classroom design, and achievement of learning outcomes) [37].

For their part, Naylor et al. have defined, in their work, four scales to measure students' experiences at university: "belonging", "feeling supported", "intellectual engagement", and

"workload stress" [78]. These scales can be related to some of the dimensions in which we have observed that the student experience is analyzed, mentioned in Section 5.2, such as "Learning Engagement", "Student Feelings and Emotions", and "Educational/Support Services".

It is interesting to mention the work of Tan et al., in which it was observed that one of the major streams of research on student experience quality in HE refers to student satisfaction with the higher education experience [11].

Thuy and Tao analyzed the impact of students' experiences on brand image perception. Unlike most studies, they adopt the experiential marketing view, which uses the SERVQUAL scale as the basis for measuring students' evaluations of HEI products or services. In their work, students' experiences attributes related to brand image perception, such as in classroom sensations and behaviors, affective experiences, and relationships, were analyzed [100].

As mentioned in Section 5.2, the factors that organizations focus on when analyzing the experience of the students are institutional and learning engagement. These are commonly evaluated together, with the related "student experience" to be used as a reference for future students regarding "good" places to study [101]. Thus, the focus on engagement is usually presented as a market focus. Regarding engagement, several studies have used their own measurement scales. This is the case in the work of Musa and Saidon, where the Student Experiential and Engagement Value Index (SEEVI) is used [74]. In this way, it is evident that the use of different measurement tools, with different approaches to students' experience, can be particularized to the analysis of specific SX factors. Similarly, Chambers and Chiang have studied how students perceive elements that challenge them to develop skills, awareness, and confidence. To accomplish this, they utilized the NSSE. As a result of their work, information has been provided to improve students' experiences, focused on three categories of high importance: "Academic experience"; "Social experience", and "Campus environment" [76].

Khalifa et al. studied the perception and engagement of higher education students of and with the various tangible and intangible services provided by their HEIs. For this work, they used the College Student Experiences Questionnaire (CSEQ) [121], which is intended to measure the quality of SX. The findings of this study show that students with disabilities experience less satisfaction with intangible services. This shows how the experience and perceptions of students vary depending on factors inherent to the students' lives [102].

Beck and Milligan investigated the factors that influence the institutional commitment (IC) of students, especially in online education. To do this, they relied on the College Persistence Questionnaire (CPQ) [103]. In their work, aspects of students' experiences were identified as predictors of IC [104]. In this way, the existence of a relationship between the SX and the IC is clear. In the work of Barrie et al., the development of an SX survey was reported, which highlights the aspects that influence SX. In the authors' words, this survey helps HEIs staff to "identify the extent to which student engagement is maximized" [105]. This again shows the relationship between students' experiences and their engagement.

Moss and Pittaway analyzed the importance of student expectations and engagement regarding HEIs during their transition stage. For this, they analyzed the student journey by identifying key touchpoints for online students in transition [89].

The holistic approach to SX has the drawback of being more difficult to assess. As we incorporate more elements to ensure an adequate approach to genuine students' experience, the analysis becomes complex. If we add to this problem the specificity of each student journey, we find ourselves, according to Heron, in a situation in which no survey or questionnaire can give a certain account of the genuine experiences of students [97].

Dollinger and Lodge, analyzing the value in SX, mention that the student satisfaction measurement should be holistic, and not one dimensional, or analyzed only at the "end of an experience" [58]. In their study it was determined that the student–staff partnerships may enhance value in the students' experiences. This statement complements the ideas that we have raised in previous sections, where the interpersonal relationships of students (both

inside and outside the classroom) directly contribute to their engagement and satisfaction. In this way, the overall student experience is improved.

Bevitt mentioned the need for an innovative assessment of student experience in higher education. For this, and in accordance with our judgment, it is necessary to use a holistic approach when evaluating SX. According to the author, the "assessment for student experience must be viewed as a complementary layer within a complex multi-perspective model of assessment" [107].

In our opinion, the process of evaluating SX has two major difficulties. First, students' perceptions are unique, personal, and subjective, which is why SX is difficult to analyze using standardized tools. Second, a student's journey is very broad and complex, and many dimensions must be evaluated. We believe that two levels of evaluation should be used. The first level should focus on the very nature of the touchpoints, to more accurately assess the perceptions of the students, considering a mixed approach (quantitative and qualitative). It should examine a student's interaction with specific services, products and systems, such as educational services, the use of information technologies for learning, and psychoeducational support services. The second level of evaluation should focus on the holistic experience of a student, considering personal aspects of the individual; scales such as SERVQUAL usually ignore cultural and/or emotional aspects. An article indicates the complexity of CX evaluation [122].

As we have observed, SX is often evaluated in terms of satisfaction. A complete SX evaluation would allow HEIs to improve the quality of their services. The instruments used for this work, which generally use self reported methods, can encourage universities to adapt and improve their service, shaping their courses and changing the way they relate to students [81].

Table 6 shows the different evaluation instruments and the studies in which they were mentioned.

Table 6. Instruments to evaluate SX aspects.

Evaluation Instrument	Studies
National Student Survey (NSS)	[63,88,96]
National Survey of Student Engagement (NSSE)	[76]
Student Experience Survey (SES)	[62,63]
Student Experience Evaluation (SEE)	[88]
Student Experiential and Engagement Value Index (SEEVI)	[74]
International Student Barometer (ISB)	[106]
SERVQUAL	[100,112,114]
Course Experience Questionnaire (CEQ)	[63]
ARCHSECRET	[113,114]
College Student Experiences Questionnaire (CSEQ)	[102]
College Persistence Questionnaire (CPQ)	[103,104]

6. Conclusions and Future Work

The term "student experience" is widely used in the literature, but unfortunately there is currently no general consensus on the term. For this reason, it is possible to find a large variety of definitions with specific approaches related to the specific purposes of each study. In addition, it has been criticized that some works using the SX concept are theoretically poorly developed [12,14]. It is worth mentioning that, in this study, we have focused on the experience of undergraduate students.

In general, the term SX is used with academic approaches and refers to the experiences of students in the context of learning and teaching, that is, learning experiences. However, it is possible to find a diversity of approaches in the literature. Among the articles that we have analyzed, the experience of students is conceived as the totality of their perceptions and interactions with different educational services, staff, and peers, while they are students.

In this study, we included some documents that did not meet some of the selection criteria. This is because some of these articles are important for conceptualizing SX as a relatively new concept [9], a topic of great interest [16], and define SX both within the academic sphere [22], and with a holistic perspective [23,24]. Other articles are relevant to understanding the student as a consumer, since they contextualize the student as a coproducer [40–42]. Other documents are useful for understanding some aspects of the student's life that influence SX, such as culture, day to day aspects, and emotions [92,93,116].

We found articles that analyze the SX concept from a customer experience approach, where the student is considered a consumer of educational products and services. This approach has been criticized, since it has been pointed out that the introduction of a market logic in higher education can homogenize the elements that compose the student's experience [25].

In view of the articles analyzed in this review, we categorized the factors that influence the students' experiences in three dimensions, analyzing the focus of the articles, the concepts covered, and the elements considered in the associated evaluation scales. The analyzed studies focused mainly on three aspects, learning and teaching, student engagement/commitment, and student wellbeing.

The observed dimensions were: (i) social dimension, which comprises relational aspects between students and the various actors with whom they interact throughout their university life, i.e., educators, HEI staff, classmates, service assistant; (ii) educational dimension, which includes factors that influence the student learning experience, i.e., learning resources, student educational support, teaching methodology; and (iii) personal dimension, which includes aspects of the student's life, i.e., sex, socioeconomic level, cultural background, health status, emotions, feelings, skill development, and day to day experiences. Within the personal dimension, it can be observed that very few articles that deal with the SX concept directly address students' emotions. This is a problem, considering that customer emotions are a critical part of the CX. Added to this is the problem that emotions and feelings are not considered as variables to estimate customer satisfaction [115,123].

SX evaluation is usually carried out in terms of students' satisfaction and uses self-reported methods to collect the required information. Scales such as NSS or a modified version of SERVQUAL for specific contexts are used. In addition, it is important to mention that a variety of instruments are used to evaluate aspects of the student's experience, such as the NSSE or the SEEVI. Surveys and questionnaires used to evaluate SX are frequently related to the quality of education and HEIs. This highlights the role of aspects such as student satisfaction in quality assurance organizations. Obviously, if students have good experiences, their satisfaction will increase.

The SX evaluation process is very challenging. This is due to the complexity of the student journey, and the fact that students' experiences are personal and are made up of subjective perceptions. For this reason, we recommend that SX evaluation should be performed at two levels; the first level should focus on the nature of the touchpoints, and the second one should focus on the holistic analysis of the student's journey.

In our view, the SX concept refers to all the physical and emotional perceptions that a student or future student experiences in response to interaction with products, systems or services provided by a HEI, and interactions with people related to the academic field, both inside and outside of academic spaces. The interactions mentioned in this definition contemplate aspects that influence the development of students such as culture, sexuality, physical disabilities, among others.

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Article

Proposing a SX Model with Cultural Factors

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Abstract: Student eXperience (SX) is a particular case of Customer eXperience (CX). It consists of all the physical and emotional perceptions that a student or future student experiences in response to interaction with products, systems, or services provided by a Higher Education Institution (HEI). SX has three dimensions: (1) social, (2) educational, and (3) personal. Currently, there is a lack of studies that address cultural aspects as an impact factor in the SX dimensions. The development of a model that encompasses these aspects would serve to develop solutions that improve the quality of education and the student's overall well-being. A holistic SX model would better address the student's environmental problems, and the SX evaluation. We present a proposal for a holistic SX model focused on undergraduate students that includes culture as a factor related to the SX dimensions. This model allows for developing holistic student solutions that could increase the HEIs perceived quality, student academic performance, and retention rates.

Keywords: student experience; student experience model; customer experience; culture; cultural aspects; higher education

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1. Introduction

The Student eXperience (SX) concept consists of all the physical and emotional perceptions and responses that a student or future student experiences in reaction to interaction with the products, systems, or services provided by a Higher Education Institution (HEI), as well as the interactions with people related to them, both inside and outside of academic spaces [1]. SX is derived from Customer eXperience (CX), of which it is a special case. This is because, during their academic life, students are consumers of HEI's products, systems, and/or services.

SX has acquired great relevance due to the COVID-19 health crisis and the constant worldwide migratory waves. This occurs due to the inherent needs of current educational systems: the need to improve the quality of education, improve the positioning of HEIs, and improve overall student satisfaction. Despite the relevance that the concept has acquired, there is no generally agreed definition of SX in the literature.

Due to the need to have a formal SX definition with a focus on CX and to detect the dimensions and factors that influence it, a Systematic Literature Review (SLR) was carried out in relation to the SX concept, their evaluation methods, and their factors/attributes. As a result of the SLR, a definition of SX was suggested, and three dimensions were detected, each one influenced by various factors of the students' academic and non-academic environment: (1) social, (2) educational, and (3) personal. Detection of these elements makes it possible to develop solutions that improve student satisfaction by considering aspects that may influence their interactions and reactions. The possibility of expanding or refining our SX model and developing a holistic model that includes some elements that can optimize student satisfaction is evident.

We believe that the national culture plays a vital role in the academic and non-academic life of students, such as performance in certain disciplines [2] or the student adaptation

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process in their first academic year. Culture could also be directly related to student subjective well-being [3] and mental health. Bearing in mind that cultural aspects are usually manifested in the SX dimensions, we have set out to develop a SX model that explicitly incorporates cultural aspects, focusing on undergraduate students. In this way, student solutions could better meet their needs by considering the aspects inherent to them. Moreover, the perceptions and expectations of people about certain events usually vary from culture to culture. The development of a SX model that incorporates cultural aspects consists of a four-stage process. The model could be used to develop a wide range of SX solutions and tools. The proposed model is theoretical and aims to identify the factors, relationships, and conceptual links between culture and SX. It is based on previously validated models, such as the Hofstede national culture model [4], and literature from related fields.

This paper is organized as follows. Section 2 introduces the theoretical background and concepts key to understanding our proposal. Section 3 presents the related work. Section 4 presents an analysis of cultural aspects in the SX dimensions. In Section 5 we present the definition of the SX dimensions and a matrix that relates the factors of the SX and the Hofstede national culture model. In Section 6 we include the limitations of our work. Finally, in Section 7, conclusions and future work are presented.

2. Theoretical Background

2.1. User eXperience (UX)

The concept of user experience (UX) refers to the subjective perceptions of the use of goods and services by a user in a specific context. The UX concept is defined by the ISO 9241-210 standard as "the person's perceptions and responses resulting from the use and/or anticipated use of a product, system or service." UX incorporates some factors such as emotions, personal beliefs/preferences, physiological/psychological responses, behaviors, and perceptions before/after consumption [5].

UX is closely related to the Human–Computer Interaction (HCI) field [6] since the ways in which users interact with digital products is a novelty compared to previous decades. This is important considering that modern students are users of computer systems provided by HEIs, so UX (and Customer eXperience) educational solutions must consider interactions with technological media with approaches from an HCI perspective.

2.2. Customer eXperience (CX)

The CX concept extends the analysis of user interactions with a single UX product, system, or service to all interactions with a brand, across the products, systems, and services it offers. These concepts are relevant in our study since, as customers, students are users of the services, products, and systems offered by higher education institutions (HEIs).

The CX term is widely used today in areas such as marketing, psychology, sociology, design, computer science, and HCI. Despite this, it does not have a unique standardized definition. CX has been defined as the "physical and emotional experiences occurring through the interactions with the product and/or service offering of a brand from point of first direct, conscious contact, through the total journey to the post-consumption stage" [7]. Lemon and Verhoef, on the other hand, defined CX as a "multidimensional construct focusing on a customer's cognitive, emotional, behavioral, sensory, and social responses to a firm's offerings during the customer's entire purchase journey" [8]. Any SX proposal from a CX perspective must consider aspects of consumers' lives, since their interactions, expectations, and perceptions tend to be subjective. The CX evaluation process is more complex than the UX one, also considering that CX analyzes multiple interactions in a much broader (time) consumption horizon than UX.

Gentile et al. (2007) suggest that CX has six dimensions [9]: (1) the emotional dimension, which involves the affective system, through the generation of moods, feelings, and emotions; (2) the sensory dimension, which involves stimulation that affects the customers senses; (3) the cognitive dimension, which is involved in conscious and thinking mental

processes; (4) the pragmatic dimension, which is involved in the practical act or process of doing something; (5) the lifestyle dimension, which is related to the values, thoughts, beliefs, and lifestyles behaviors of a person; and (6) the relational dimension, which involves the person, in addition to his social context and relationships with other people. We find it pertinent to use this CX model because it incorporates the main types of value for customers [10], among which we could classify students based on consumption focused on efficiency, excellence, status, ethics, or spirituality. This is based, not necessarily on the disciplines that the student studies in the HEIs, but also on the personal motivations to study and their enthusiasm towards the contracted service.

2.3. Student eXperience (SX)

The Student eXperience (SX) is a widely used concept, which lacks a general agreement regarding its meaning [11]. The given use of the concept usually has relevance in specific contexts. Even so, the concept of SX is clearly related to the satisfaction and needs of students. Since its inception, it has been used mainly in academic environments, but over time it has been observed that SX includes aspects that go beyond the classroom and reach aspects of the students' daily life. Douglas et al. (2008) defined SX within the academic area as the "experience of higher education teaching, learning and assessment and their experience of other university ancillary service aspects" [12]. As mentioned, the concept has been used outside the academic sphere. This is the case with some authors who use the "total student experience" concept to refer to students' experiences in broader contexts than the classroom [13,14].

We recently carried out a SLR on the SX concept [1]. As a result of this work, it was possible to define the concept from a CX perspective, where the students are a particular type of customer. In this way, the SX are all the physical and emotional perceptions and reactions that a student or future student experiences in response to interaction with the products, systems, or services provided by a HEI, and interactions with people related to the academic field, both inside and outside of academic space. In this SLR we also identified that SX has three dimensions (see Figure 1). This is based on the factors commonly treated in investigations in the educational field and student experience evaluation methods. The three SX dimensions are:

1. Social: This dimension is related to community relationships and institutional engage- ment. Although students constantly interact with people in a society, this dimension focuses on interpersonal relationships within HEIs (student–student) and especially interactions with staff (student–administrative and student–educator for example). Along with the interactions, this dimension analyzes the feeling of institutional belonging, or engagement, of the students.
2. Educational: This dimension is related to Students' Learning Engagement, Higher Education Quality, Learning Resources/Learning Environment, and Educational/Support Services. This dimension encompasses any aspect that focuses on promoting an adequate educational environment or maximizing the educational outcomes of students (teaching methodologies, technological infrastructure, educational support networks). Consequently, these aspects translate into a positive perception of the quality of the HEI, which is why quality has been incorporated into this dimension.
3. Personal: This dimension is related to student development and outcomes, student feelings and emotions, environment relationship, student thoughts, and students' identity and background. Personal aspects of each student's life that may influence interactions and perceptions with HEI services and products are considered. This dimension encompasses aspects related to culture, socioeconomic level, disabilities, personal aspirations, family structure, and leisure, among others.

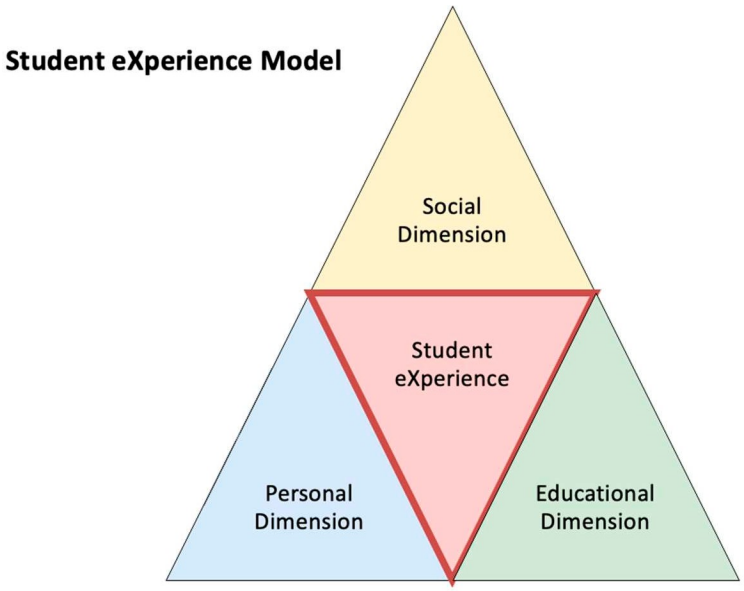

Figure 1. Student eXperience dimensions.

In the detected SX dimensions in the literature, poor analysis of cultural aspects was observed. We consider this a problem since cultural aspects are especially relevant in SX. This is in view of the role played by cultural capital in studies (learning outcomes) and the cultural identity of international students in their personal adaptation process [15–17].

Culture acts transversally at the level of various factors that make up the SX, as evidenced in later sections. SX includes, per se, factors related to retention rates [18,19] and academic performance [20]. Solutions that seek to improve student satisfaction also have a direct impact on the quality perceived by students, since satisfaction is noted as an indicator of quality in HEIs [13,21]. In addition, some technological solutions can have a positive influence on students' perceptions and, therefore, on their satisfaction. Culture has been related to the technological interaction of consumers with some of these solutions [22–25]. In this way, culture may influence students' psychopedagogical aspects, which could influence the HEIs perceived quality based on academic performance, retention rates, and direct evaluation by students.

As a result of this, we propose an SX model that incorporates traditionally ignored cultural elements to subsequently develop tools that allow for better SX evaluation and support. This model focuses on undergraduate students in HEIs. The use of this model at higher levels, such as graduate or postgraduate studies, may not effectively reflect the real needs and expectations of students.

2.4. Culture

Culture is a fundamental element in our societies. Analyzing culture could help to explain the way in which students relate to their environment and perceive external stimuli. Hofstede (2001) defined culture as "the collective programming of the mind that distinguishes the members of one group or category of people from another" [4].

The cultural factors analysis is especially important in the cases of refugee and exchange students. This is because these students are more likely to have culture shock when their values come into conflict with those of the local people. Also, understanding students' cultural background plays an important role when implementing teaching methodologies and promoting HEI inclusion policies.

The cultural dimensions used to develop our SX model correspond to those of Hofstede's National Culture model [4]. Hofstede's national culture dimensions were developed in 1980 from the results of a large perception survey of workers in IBM offices, conducted between the 1960s and 1970s. The results of the surveys were subjected to statistical factor

analysis by Hofstede, who was able to establish causal relationships between the behaviors and perceptions of people belonging to specific national cultures, defining four initial national culture dimensions. In 1991, Chinese sociologists conducted a cultural study that established a national culture dimension referring to the long-/short-term orientation of individuals in a society [26]. Hofstede included this dimension in his model later [27]. The addition of the sixth national culture dimension, referring to indulgence and restraint, and the verification of the previous five dimensions was carried out after Minkov's studies on data from the World Values Survey [28].

The choice of Hofstede's cultural model is because it has been widely validated after multiple practical applications. Additionally, this model has incorporated more dimensional elements over time [29] and the dimensions of other cultural models have a direct (correlational) relationship with the dimensions proposed by Hofstede [30–32].

CX or UX solutions that incorporate cultural factors are not new [33]. The positive results in the industry when considering cultural elements in solutions have been an incentive to develop an SX model that includes cultural dimensions. Table 1 details the six national culture dimensions proposed by Hofstede and their respective abbreviations.

Table 1. Hofstede's national culture dimensions.

Abbreviation	Cultural Dimension	Description
PD	Power Distance	PD dimension refers to the human inequality problem. This element determines people's acceptance degree to submit themselves to the orders of an entity or individual in a hierarchical system. This applies both in society and in institutions.
IDV	Individualism vs. Collectivism	IDV dimension refers to the individual's degree (and predisposition to) of integration into primary groups in a society. In addition, this element determines group or individual thinking.
MAS	Masculinity vs. Femininity	MAS dimension refers to men's and women's emotional roles in society (and institutions). This element is related to individuals' assertiveness, apart from sexuality.
UA	Uncertainty Avoidance	UA dimension refers to the stress level perceived by individuals in a society as a function of an uncertain future. This element determines the degree of risk that individuals are willing to accept in societies and institutions.
LTO	Long-Term Orientation vs. Short-Term Orientation	LTO dimension refers to the focus of the people's efforts. In this way, it is analyzed if people in a society are focused on the past, the present, or the future, and if they seek rewards in the short, medium, or long term.
IVR	Indulgence vs. Restraint	IVR dimension refers to people's relationship between control and gratification of their desires. This element is related to enjoying life and the moral perception of leisure in society.

The identification of SX cultural aspects allowed us to analyze the satisfaction or dissatisfaction that students experience throughout their university life. In simple terms, studying the cultural factors involved in students' interactions with HEIs gives us important insights into how we can improve their holistic experience. This is ideally framed in an SX evaluation process.

3. Related Work

Carrying out our SX model with cultural aspects required defining the SX and national culture factors to incorporate. Regarding the SX factors to be incorporated into the model, these were based on a SLR on the concept of SX, the factors and dimensions that constitute it, and its traditional evaluation methods. Prior to our SLR, we worked on nonsystematic reviews on the SX concept [11] and the emotional aspects of SX (part of the third dimension of SX) [34]. Additionally, we analyzed a national SX in a crisis study case (Chile) [35], and a preliminary analysis of the cultural aspects present in the SX [36]. As a result of our reviews, we did not find a pre-existing SX model, much less one that incorporates cultural aspects. This certainly favors the impact of our SX model proposal.

Regarding the cultural factors to incorporate in our proposed model, we have chosen to use Hofstede's' national culture dimensions [4,29]. The reason for this is that the dimensions of traditional cultural models usually have a direct correlation with the dimensions of Hofstede's model [30–32,37]. In this regard, we should point out that the focus on a specific cultural model is not a problem. This is because existing cultural models often share common elements. In this way, culture is usually analyzed as a multilevel and multidimensional phenomenon. Furthermore, in cultural models it is generally agreed that culture refers to a set of stable values widely diffused in a society over a relatively long time [4,37].

The use of the Hofstede model has the advantage of having several investigations associated with the educational field that can help complement our proposal. Some examples of this are a study that relates the Hofstede dimensions of LTO and IVR with the academic performance of students [2]; a study that analyzes the LTO, IDV, and UA with respect to teaching methodologies [38]; a study that relates the cultural dimensions of Hofstede with respect to online learning [39]; and a study that analyzes the dimensions of UA and PD regarding the student learning process [40].

4. Analysis of Cultural Aspects in the SX Dimensions

The SX culture model development consists of a four-stage process (Figure 2): (i) the compilation of bibliographic material and the identification of SX dimensions and factors; (ii) the identification of factors and dimensions of the national culture in the literature; (iii) union of the factors and dimensions of the SX and the national culture models; and (iv) the consolidation of the model with the common SX cultural elements.

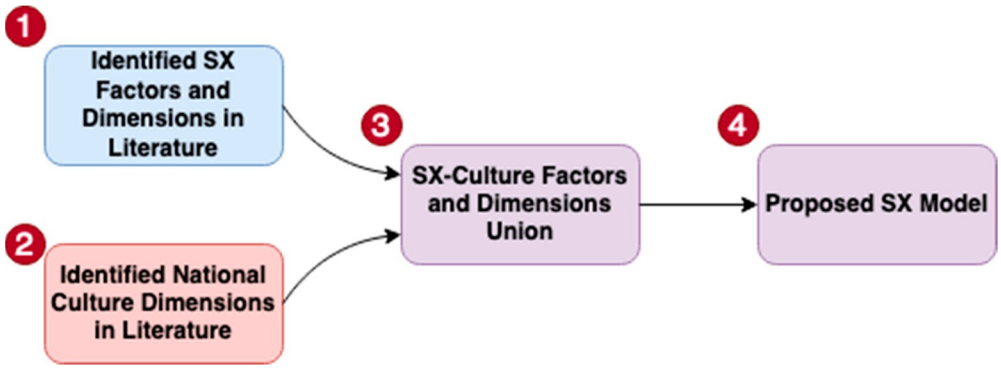

Figure 2. Student eXperience model development stages.

As part of the third stage of the model development process, we carried out a factor-by-factor analysis of the elements that make up the cultural and SX models. We analyzed the relationship of people in a society with respect to culturally diverse topics such as general norms, gender, and family, and related them to the SX dimensions that could be influenced by them (Tables 2–6). In doing so, we have been guided by the elements identified by Hofstede referring to each national culture dimension and the factors that make up each SX dimension.

Table 2. General norm, family, school, and healthcare aspects of power distance in SX.

Power Distance: General Norm, Family, School, and Healthcare		
Power Distance Aspect	**Related SX Dimension**	**Comment**
Attitude towards people's Inequalities	Community Relationship, Educational/Support Services, Student Feelings and Emotions, Environment Relationship	How people approach relationships of equality or inequality in interpersonal treatment (asymmetrical) can explain the communicative dynamics of student–student, student–professor, student–official, in addition to the communicative output
How relationships should be handled	Community Relationship, Student Feelings and Emotions, Environment Relationship	The way in which the subjects relate to each other in the non-strictly academic environment
On the relationship and dependence of more or less powerful people	Community Relationship, Student Feelings and Emotions, Environment Relationship, Educational/Support Services	The adopted attitude in the student–student, student–teacher, and student–official relationships, depending on the perceived 'power'
On the relationship of obedience and respect between children and parents	Educational/Support Services, Institutional Engagement	The obedience and respect that the students demand and have with the professors and HEI. We believe that the student's obedience to the HEI contributes to their institutional engagement given the possible family source of financing for their studies
On the role of children in old-age parents' security	Student Development and Outcomes	The possible cultural/economic/personal motivation of the student or his/her family to invest in education
On equality relationships between students and teachers	Learning Engagement	The educational commitment that the teacher can elicit from his/her students depending on the level of authority perceived by the students
About the teacher's initial expectations from students	Student Development and Outcomes, Learning Engagement	The student–teacher dynamic that determines the teaching style. This influences the skills developed and commitment by students
On the expected role of teachers when educating	Higher Education Quality, Learning Engagement	The perceived quality of classes based on the expected role of teachers by students
On the factors that influence the quality of learning	Higher Education Quality	Who the students look at when determining the HE quality (themselves or the educators)
On authoritarian values in less or more educated persons	Educational/Support Services, Institutional Engagement	The degree of authoritarian values that more or less educated people show. This can influence the desired service level by students. This can influence their institutional engagement
About the educational policy focus	Higher Education Quality, Student Development and Outcomes	The relationship lies in the educational policy focus (on secondary schools or universities). This can influence students' perceived HEI quality

Table 3. General norm and family of individualist/collectivist societies in SX.

Individualism/Collectivism: General Norm and Family		
IDV Aspect	**Related SX Dimension**	**Comment**
About the family structure (nuclear or not)	Community Relationship, Student Feelings and Emotions, Learning Resources/Learning Environment	How family relationships can influence or replicate the student's not strictly academic social environment
Children learn to think in terms of we or I	Community Relationship, Institutional, Engagement, Student Feelings and Emotions, Learning Resources/Learning Environment	How the group thinking of students can influence their communicative dynamics inside and outside the classroom
To whom the same value standards (exclusionist/universalism) apply	Community Relationship, Student Feelings and Emotions	How students value standards can influence their communicative dynamics outside the classroom
Do students avoid direct confrontations?	Community Relationship, Educational/Support Services, Learning Resources/Learning Environment, Student Feelings and Emotions	How students' willingness to engage in confrontation can influence their communicative dynamics inside and outside the classroom
Friendship is predetermined or voluntary?	Community Relationship, Student Feelings and Emotions	How friendship relationships can influence students' communicative dynamics outside the classroom
Individual or collective ownership of resources	Community Relationship, Student Feelings and Emotions, Learning Resources/Learning Environment, Educational/Support Services	How students' ownership ideals can influence their perception about learning resources and educational support services
Adult children live with parents or leave the parental home?	Student Feelings and Emotions, Educational/Support Services	How home formation can influence the financing of studies
Students have a High-context or Low-context communication?	Community Relationship, Learning Resources/Learning Environment, Student Feelings and Emotions	How students' communicative context can influence their social dynamic inside and outside the classroom
Socialization in public places or at home?	Community Relationship, Student Feelings and Emotions, Learning Resources/Learning Environment	How students' socialization places can influence their communicative dynamics inside and outside the classroom
Trespasses lead to shame and loss of face for society or guilt and loss of self-respect	Community Relationship, Student Feelings and Emotions, Learning Resources/Learning Environment, Student Thoughts	How trespasses' effects can shape social relations inside and outside the classroom
About the criteria for marriage partners (predetermined or not)	Community Relationship, Student Feelings and Emotions, Educational/Support Services	How student marriage can influence the financing of studies and the student's social life
Influence on girls' beauty ideals (girlfriends or boys)	Community Relationship, Student Feelings and Emotions	How the student's beauty ideals can influence their communicative dynamics outside the classroom

Table 4. Gender and sex in SX.

Masculinity/Femininity: Gender and Sex		
MAS Aspect	**Related SX Dimension**	**Comment**
Opinion about being responsible, decisive, ambitious, caring, and gentle as a feminine/masculine quality	Community Relationship, Learning Resources/Learning Environment, Student Development and Outcomes, Student Feelings and Emotions, Environment Relationship	The social consequences of being responsible, decisive, ambitious, caring, and gentle, and their impact on personal/academic development and interpersonal relationships inside and outside the classroom.

Table 4. *Cont.*

Masculinity/Femininity: Gender and Sex		
MAS Aspect	**Related SX Dimension**	**Comment**
What implies women's liberation?	Student Development and Outcomes, Student Feelings and Emotions	The impact that the notion of women's liberation has on academic self-demand and on the search for leadership spaces. In addition to the emotional impact of the student
Single standard (both sexes are subjects) or double standards	Community Relationship, Student Development and Outcomes, Environment Relationship, Student Feelings and Emotions	The role that male and female students adopt when interacting with each other, in personal aspirations, and in terms of emotional impact
About norms for showing male or female nudity	Community Relationship, Environment Relationship, Student Feelings and Emotions	The social dynamics that the perception of nudity has for students, and the emotional impact
Explicit (or not) discussion of sex, and lesser or greater implicit erotic symbolism	Community Relationship, Environment Relationship, Student Feelings and Emotions	The social dynamics that the perception of eroticism has on students and its emotional impact
Is sex a way for two persons to relate or imply exploitation?	Community Relationship, Environment Relationship, Student Feelings and Emotions	The couple dynamics of students and the emotional impact, with the corresponding social consequences
Sexual harassment is considered a big or minor issue in society?	Institutional Engagement, Educational/Support Services, Student Development and Outcomes, Student Feelings and Emotions, Environment Relationship	The social dynamics that the perception of sexual harassment has for students, and the role that educational services and the HEI have to correct these acts
Homosexuality is considered a fact of life or a threat to society?	Community Relationship, Institutional Engagement, Educational/Support Services, Student Feelings and Emotions, Environment Relationship	The social dynamics that the perception of homosexuality has for a student, and the role that educational services and the HEI have to remedy these acts

Table 5. General norms and family aspects of long-term orientation societies in SX.

Long-Term Orientation: General Norms and Family		
LTO Aspect	**Related SX Dimension**	**Comment**
Social pressure toward spending money or thrift	Educational/Support Services, Student Development and Outcomes	The student's need to obtain financial support due to their savings
Perseverance vs. quick results	Student Development and Outcomes	The student's perception of their academic progress
Concern with social obligations vs. willingness to subordinate oneself for a purpose	Community Relationship, Learning Engagement, Environment Relationship	The commitment that the student develops to his/her environment and HEI
Concern about one's face and sense of shame	Community Relationship, Environment Relationship	The impact on the student's social dynamics of a sense of shame
Respect for traditions or circumstances	Community Relationship, Environment Relationship	The impact of the student's social dynamics because of the interaction with people with different traditions or in different circumstances
Concern with personal stability or personal adaptiveness	Community Relationship, Environment Relationship, Learning Engagement	How stability or adaptability allow the student to adapt to their environment, and to the rhythm of the HEI courses

Table 5. *Cont.*

Long-Term Orientation: General Norms and Family		
LTO Aspect	**Related SX Dimension**	**Comment**
Marriage as a moral arrangement or a pragmatic arrangement	Community Relationship, Educational/Support Services, Environment Relationship	How the student's marriage can affect their social relations in HEIs, and also their finances
Is living with in-laws normal or a source of trouble?	Educational/Support Services, Environment Relationship	How living with in-laws can affect students' emotions and finances
Did young women associate affection with a boyfriend or husband?	Community Relationship, Environment Relationship	How female student affection can affect their social relations in HEIs
Humility is for men and women or women only	Community Relationship, Environment Relationship	How student humility affects their social relations in HEIs and their social image
Old age is an unhappy period that starts late vs. is a happy period that starts early	Student Development and Outcomes	How the pressure of age motivates the student to study and obtain results sooner or later
Can preschool children be cared for by others (not their mothers)?	Community Relationship, Environment Relationship, Educational/Support Services	How the family burden influences the relationship of students with their social environment, and what they expect from student support services
Children get gifts for fun and love vs. for education and development	Learning Engagement	How students have been conditioned to be motivated by educational elements in their lives

Table 6. General norm, personal feelings, and health aspects of indulgence/restraint societies in SX.

Indulgence vs. Restraint: General Norm, Personal Feelings, and Health		
IVR Aspect	**Related SX Dimension**	**Comment**
Percentages of very happy people	Community Relationship, Student Feelings and Emotions, Environment Relationship	The social dynamics that provokes the student's emotional predisposition
There is a perception of personal life control or a perception of helplessness?	Educational/Support Services, Student Development and Outcomes, Student Feelings and Emotions	The student's sense of personal progress and the susceptibility they have to request help from HEI support services based on their helplessness perception
Importance of leisure	Environment Relationship, Student Feelings and Emotions	How leisure positively regulates the emotions of students and strengthens social ties
Importance of having friends	Environment Relationship, Student Feelings and Emotions	How having friends positively regulates the emotions of students and strengthens social ties
Is thrift important?	Educational/Support Services, Student Development and Outcomes	How savings can affect the students' academic progress and their relationship with the HEIs financial services
Loose or tight society	Environment Relationship, Student Feelings and Emotions	How society regulates the student's behavior, and how this affects the student emotionally
Likeliness to remember positive emotions	Environment Relationship, Student Feelings and Emotions	The social dynamics that provokes the student's emotional predisposition
Degree of moral discipline	Environment Relationship, Student Feelings and Emotions	How students behave, and how this affects the student emotionally
Positive attitude vs. Cynicism	Student Development and Outcomes, Environment Relationship, Student Feelings and Emotions	How a positive attitude fosters the development of academic skills, and how this affects the student emotionally

Table 6. *Cont.*

Indulgence vs. Restraint: General Norm, Personal Feelings, and Health		
IVR Aspect	**Related SX Dimension**	**Comment**
Extroverted personalities vs. neurotic personalities	Environment Relationship, Student Feelings and Emotions	The social dynamics that provokes the student's personality
Percentages of people who feel healthy	Educational/Support Services	How the perception of the students' health motivates them to seek help from the HEI medical services
Optimism degree	Learning Engagement, Student Development and Outcomes, Student Feelings and Emotions	How an optimistic attitude fosters the development of academic skills, compromises the student academically, and how this affects the student emotionally
Birth Rate in relation to family income	Educational/Support Services, Student Development and Outcomes	How the family and financial burden affects the students' academic development, and its relationship with the HEIs financial/social services
Death rates from cardiovascular diseases	Educational/Support Services, Student Feelings and Emotions	The student search for HEI medical services and his relationship with death

After this analysis, we developed a matrix that allows us to see the relationship between cultural aspects and SX dimensions (Figure 3). With the matrix, it is clear what SX factors are influenced by specific cultural elements. This matrix was finally used to integrate the cultural aspects to a new SX model.

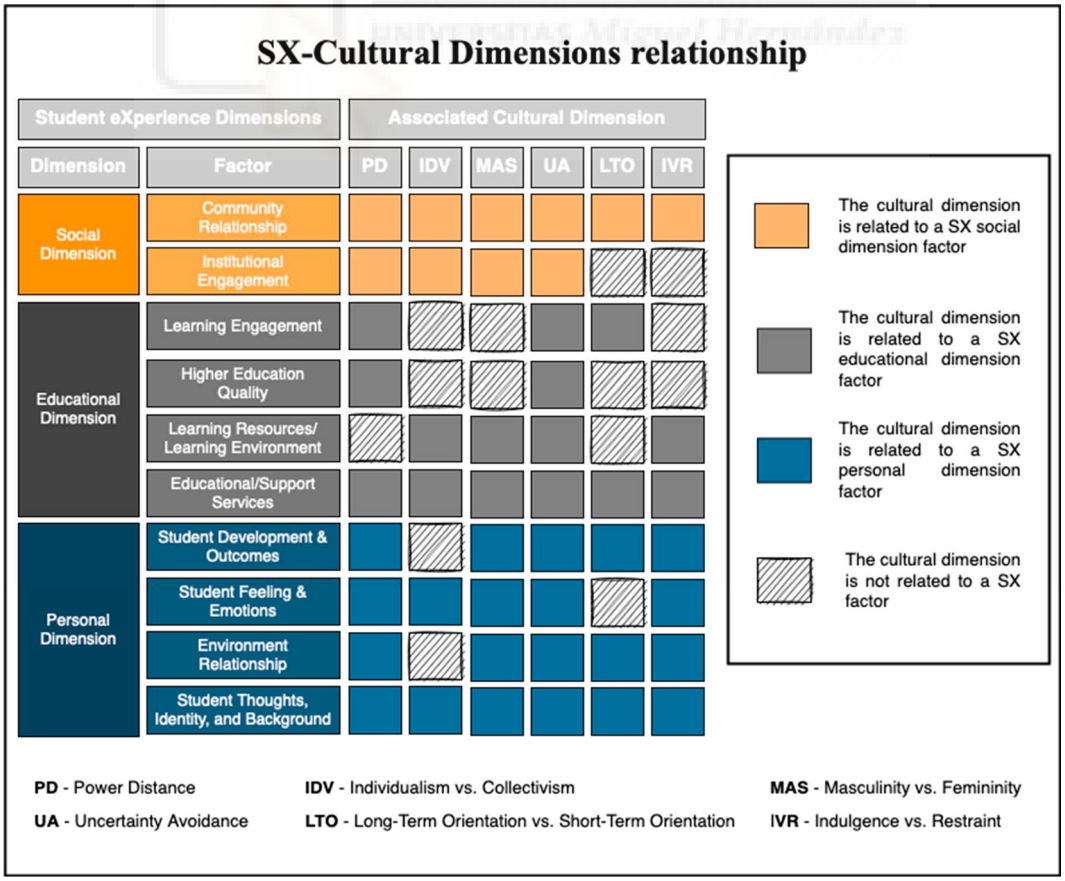

Figure 3. SX cultural dimensions relationship.

It is important to note that the proposed model is theoretical. Its validation must be empirically verified through practical application, expert judgment, and statistical methods. Future work contemplates the development of a practical SX evaluation methodology and the development and systematic application of a scale that incorporates cultural aspects.

4.1. Power Distance (PD) and Student eXperience

Hofstede defines Power Distance (PD) as "the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally" [29]. Within his conception of an institution, as basic elements within a society, he considers schools. By extension of that concept, the Power Distance can be seen in HEI, such as universities and colleges. This concept is related to the subject's perception of an authority figure. The subjects in an organization can perceive paternalistic or autocratic treatment, to a greater or lesser extent. The relationship between subjects of different levels of authority is related to the dependency between people. Additionally, the emotional distance between subjects determines the degree of communication. This is because the degree of fear of the subordinates defines the ease of approaching and contradicting authorities directly.

The Power Distance Index (PDI) indicates the degree of dependency of subjects under an authority figure in an organization/institution within a country. For a student from a country with a PDI score very different from that of the new country of residence, there could be culture shock. Consequently, anxiety or discomfort could be generated that could affect the perceived quality and satisfaction with respect to the services provided by an HEI.

Within an HEI, there may be student–teacher or student–administrator relationships. Considering the hierarchical structure of the institutions and the services they provide, we believe that the Power Distance is mainly related to the Institutional Engagement in the social dimension of the SX; the relationship of the students with the Educational/Support Services in the educational dimension; and the Student Feelings and Emotions, and Student Development and Outcomes in the personal dimension. To a lesser extent, the distance to power could be evidenced in the student's Community Relationship, in the social dimension, and in the environmental aspects in the educational and personal dimension, in situations in which they interact with subjects in a high position in the HEI.

Studies related to Power distance have been conducted on subjects not necessarily directly involved in business settings. This includes the use of students as test subjects [30]. It has been observed that students scoring high on power distance tend to have thoughts related to "Having few desires," "Moderation, following the middle way," and "Keeping oneself disinterested and pure." Students in countries scoring low on power distance tend to have thoughts related to "Adaptability" and "Prudence." It is important to mention that it has been observed that student power distance affects classroom activity and interaction [41]. In this way, the importance of analyzing this cultural dimension is evident when developing solutions that aim to improve the SX.

Table 2, built from the empirical analysis of the PD elements, relates the general norm, family, school, and healthcare values to the factors that make up the SX dimensions.

4.1.1. Power Distance in Student eXperience: Social Dimension

In the social SX dimension, the distance to power is evidenced mainly by institutional engagement. This is because student engagement is strongly linked to the degree of trust inspired by authority figures, such as teachers and high-ranking administrators. In this way, it will be more difficult for students to engage with HEIs if they perceive autocratic treatment. This is especially important when we consider students from countries with low PDI in countries that have a higher PDI score. Additionally, when students associate power distance with adaptability, this dimension is related to the Community Relationship aspect of the social dimension of SX. This is because the student's adaptation process takes place in part with respect to the university community.

4.1.2. Power Distance in Student eXperience: Educational Dimension

In the educational dimension of the SX, the distance to power is evident with respect to the Educational/Support Services. This is because students may perceive paternalistic treatment by student support services. This, depending on the cultural background of the students, can cause a negative reaction, in terms of emotions and satisfaction. Furthermore, in the words of Hofstede, "effective learning in such a system depends very much on whether the supposed two-way communication between students and teacher is, indeed, established".

The PD is also related to the perceived quality of education, since quality of learning, which is related to HE quality, is determined by the excellence of the students. This value is strongly associated with the PD values related to adaptability and desires.

4.1.3. Power Distance in Student eXperience: Personal Dimension

As PD is associated with the desire for progress within the institution, it is related to the "Student Development and Outcomes" aspect of the personal dimension of the SX. Additionally, like the desire for power in the social dimension, when students associate power distance with adaptability, this dimension is related to the Environment Relationship aspect but at a personal level, not strictly in an academic setting.

The PD is also related to the Student Feelings and Emotions of the SX personal dimension. This is because, in one way or another, the feelings caused by an autocratic or paternalistic figure in their immediate environment (not necessarily academic) will have an impact on their state of mind and their expectations of their environment.

4.2. Individualism/Collectivism (IDV) and Student eXperience

The dimension of individualism vs. collectivism (IDV) is defined based on the two central concepts: Individualism and Collectivism, which are opposites. Hofstede details that "Individualism pertains to societies in which the ties between individuals are loose: everyone is expected to look after him- or herself and his or her immediate family. Collectivism as its opposite pertains to societies in which people from birth onward are integrated into strong, cohesive in-groups, which throughout people's lifetime continue to protect them in exchange for unquestioning loyalty." In this way, it is evident that this dimension is present in instances in which the student is part of or is affected by group processes. This occurs in the classroom, when working on group projects; in relation to processes that require reaching consensus between students and teachers or students and educa- tional authorities; and in processes of the student's personal life, contained in the personal dimension of the SX.

As result of the individual subjects' data collected in the Hofstede study, he identified some work goals. These are: (1) personal time, which refers to having a job that leaves sufficient time for family life and leisure; (2) freedom, which refers to having enough freedom to adopt a personal job approach; and (3) challenge, which refers to having challenging work and tasks to do in which a sense of personal accomplishment could be achieved.

Regarding collectivist individuals, elements related to the following work goals were detected: (4) training, which refers to having work training opportunities (to improve skills or learn new skills); (5) physical conditions, which refers to good physical working conditions (good ventilation and lighting, adequate workspace, etc.); and (6) use of skills, which refers to fully using skills and abilities on the workplace. Although these data were originally collected from the opinions of IBM employees by Hofstede, later works in the field of culture defined dimensions such as those detected by Hofstede and with a high degree of correlation in their results [29].

As with the cultural dimension related to power distance, because of studies that replicated Hofstede's work with test subjects related to the academic world, phenomena that are directly related to SX dimensions were detected. Students with a high index of individualism found the following values particularly important: (1) "tolerance of oth-

ers," (2) "harmony with others," (3) "noncompetitiveness," (4) "a close, intimate friend," (5) "trustworthiness," (6) "contentedness with one's position in life," (7) "solidarity with others," (8) and "being conservative." Regarding students with a rather collectivist background, they found the following important values: (9) "filial piety (obedience to parents, respect for parents, honoring of ancestors, financial support of parents)," (10) "chastity in women," and (11) "Patriotism" [30]. Regardless of the pole to which these values belong (Individualism or Collectivism), they can be related to aspects of the SX dimensions. All of them are manifested directly or indirectly in situations of collective action. For this reason, the cultural dimension related to collectivism vs. individualism is observed in the Community Relationship aspect of the SX social dimension, in the Resources/Learning Environment and Educational/Support Services aspects of the SX Educational dimension, and in the Student Feelings and Emotions and Student Thoughts, Identity, and Background aspects of the SX personal dimension.

It is important to mention works that have analyzed the relationship of IDV and PD cultural dimensions in learning-specific contexts [42,43]. In this way, we can exemplify the impact of this cultural dimension in the SX Learning Environment dimension; HEIs should consider culturally foreign students who, based on their cultural background, prefer to study individually. Certainly, it would be unsatisfying for a student to feel compelled to change their study habits both inside and outside the classroom.

Table 3, built from the empirical analysis of the IDV elements, relates the general norm and family values to the factors that make up the SX dimensions.

4.3. Masculinity vs. Femininity (MAS) and Student eXperience

According to Hofstede, the cultural dimension associated with masculinity vs. femininity (MAS) is related to the assertive or modest behavior of a subject. It should be noted that both 'masculine' and 'feminine' refer to social roles commonly associated with males and females, respectively. In this way, the masculine is associated with traits commonly observed in males such as assertiveness, competitiveness, and toughness. Regarding the feminine term, it is related to traits commonly observed in females such as caretaking, relationship concerns, and living environment concerns. In this way, and in the words of Hofstede, a society "is called masculine when emotional gender roles are clearly distinct: men are supposed to be assertive, tough, and focused on material success, whereas women are supposed to be more modest, tender, and concerned with the quality of life. A society is called feminine when emotional gender roles overlap, both men and women are supposed to be modest, tender, and concerned with the quality of life" [29].

Individuals identified with a masculine profile tend to seek four goals in organizations: (1) increase their earnings, (2) gain recognition for doing a good job, (3receive a promotion, and (4) have challenging work to do. The fourth goal is associated with the IDV dimension. On the other hand, individuals identified with a female profile tend to seek four goals in organizations: (5) have good relationships with their direct superiors at work, (6) achieve cooperation in the workplace, (7) live in a desirable area with their family, and (8) have the security that they will be able to work for their company for as long as they want. As with the previously mentioned cultural dimensions, masculine and feminine qualities can be observed in the context of organizations and institutions of different kinds. It should be noted that the dimension of masculinity vs. femininity is very controversial, and other cultural models have chosen to use a more politically correct approach. A review of 19 replications of Hofstede's initial study confirms this [44]. Despite the terminological differences between the various studies that address this dimension, it is possible to observe a strong correlation between these elements with those exposed by Hofstede [45]. We consider it necessary to mention that gender stereotypes may be due to cultural/social norms [46]. Thus, some aspects that vary from one culture to another may be considered uncomfortable or unfair by some people.

Table 4, built from the empirical analysis of the MAS elements, relates the gender and sex values with the factors that make up the SX dimensions.

4.3.1. Masculinity vs. Femininity (MAS) and Student eXperience: Social Dimension

The cultural dimension regarding the MAS is directly related to all the factors that make up the social dimension of the SX. That is, community relationships and institutional engagement. This is mainly due to the goals sought by both parts of the MAS spectrum; the relationship with direct superiors (teachers for example) and cooperation in the classroom are easily related to the subject's predominantly feminine state.

4.3.2. Masculinity vs. Femininity (MAS) and Student eXperience: Educational Dimension

Masculinity and femininity are mainly related to two SX dimensions: learning resources/environment and HCI educational/support services. Both, as with the social dimension, are due to the cooperation sought by people with a more feminine than masculine profile.

4.3.3. Masculinity vs. Femininity (MAS) and Student eXperience: Personal Dimension The

MAS cultural dimension is related to all the elements of the personal dimension of the SX. This includes the Student Thoughts, Identity, and Background factor, which intrinsically includes the students' cultural and social background. The student development and outcomes, as a factor of SX, is related to masculine aspects. This is in view of the desire for a challenging educational environment, desire for personal growth, and academic recognition. Students' emotions are directly related to assertive behavior and/or modest behavior. The relationship with the environment, not necessarily educational, is conditioned to the two behaviors mentioned.

4.4. Uncertainty Avoidance (UA) and Student eXperience

The fourth cultural dimension of Hofstede's model is related to the uncertainty avoidance (UA) of people in a society. He defines uncertainty avoidance as "the extent to which the members of a culture feel threatened by ambiguous or unknown situations." This di- mension is related to the feeling of nervous stress, which can be associated with a need for written (and unwritten) rules that reduce ambiguity in a particular context. The Uncertainty Avoidance Index (UAI) provides a value for the degree to which individuals perceive ambiguous or unknown situations. A UAI of 0 is related to the weakest uncertainty avoidance per country, versus 100 for the strongest.

It is important to analyze uncertainty avoidance in relation to students, mainly because this cultural dimension is strongly linked to the feeling of anxiety and stress. This is evidenced by the correlation observed between Lynn's country anxiety scores and the UAI scores found by Hofstede [29,47]. In addition, it was observed that, in countries with weak UAI, anxiety levels are relatively low. Otherwise, in countries with strong UAI, the level of stress experienced is high, which usually leads to adverse mood states and psychological problems such as anxiety and depression [48].

This cultural dimension transversally affects all the dimensions of the SX, because in any of them the students can feel threatened by ambiguous or unknown situations. Even so, Hofstede observed certain characteristics of this dimension in the educational environment. Although this was not observed in HEI but in summer schools, it can be extended to this educational level. He observed that students from strong uncertainty avoidance countries expect their professors to be "experts who have all the answers." A relationship of UA was also observed with the clarity of the teachers when communicating, the approaches when evaluating the students, and the attribution of their own merit by the students. Ultimately, UA is present in all dimensions of the SX.

4.5. Long-Term vs. Short-Term Orientation (LTO) and Student eXperience

The dimensions defined by Hofstede include some that were not detected in his initial work. An example of this is the Long-Term Orientation (LTO) dimension that originated from the contrast of its cultural dimensions with those obtained after the development of the Chinese Value Survey (CVS) [29]. As a result of the development of the CVS, four

dimensions were detected, of which three had a correlative dimension in the proposed Hof- stede model. The LTO dimension was included as a fifth cultural dimension by Hofstede, who considered it relevant and not correlating with the uncertainty avoidance dimension. In his formal definition, he said that "long-term orientation stands for the fostering of virtues oriented toward future rewards in particular, perseverance and thrift. Its opposite pole, short-term orientation, stands for the fostering of virtues related to the past and present respect for tradition, preservation of 'face', and fulfilling social obligations".

The LTO refers, like the aforementioned dimensions, to two opposite value poles. On the one hand we have the values of (1) persistence/perseverance, (2) thrift, (3) ordering relationships by status and observing this order, and (4) having a sense of shame. At the opposite pole we have the values of (5) reciprocation of greetings, favors, and gifts, (6) respect for tradition, (7) protecting one's "face," and (8) personal steadiness and stability. The value contrast between the opposite poles of LTO is important. For example, in countries with a low rate of LTO, students attribute their success or failure to luck, while those with a high rate of LTO students attribute success to effort and failure to a lack of it. In addition, talent in mathematics subjects has been associated with students from countries with a high LTO index and a talent for theoretical, abstract sciences in countries with a Short-Term Orientation or low LTO. As a result of points 3–8, the role of the LTO dimension with respect to the social factors of the SX dimensions is evident, both in the social interactions of the social dimension and in the personal dimension. As for points 1 and 2, these can be directly related to educational factors of the SX. For example, tolerance of failure (associated with university dropout), school performance, and self- improvement/enhancement are associated with the value of persistence/perseverance and with the educational engagement of the educational dimension of the SX. Meanwhile, the mere fact of studying, being considered by students as a long- or short-term investment, is associated with the value of thrift.

Table 5, built from the empirical analysis of the LTO elements, relates the general norm and family values with the factors that make up the SX dimensions.

4.6. Indulgence vs. Restraint (IVR) and Student eXperience

Hofstede's sixth cultural dimension deals with the poles of indulgence versus restraint (IVR). This summarizes the tendency of individuals in a society to have life control, leisure time, and happiness or Subjective Well-Being (SWB). Hofstede defines this dimension as follows: "Indulgence stands for a tendency to allow relatively free gratification of basic and natural human desires related to enjoying life and having fun. Its opposite pole, restraint, reflects a conviction that such gratification needs to be curbed and regulated by strict social norms".

The notable values of this dimension are (1) higher percentages of very happy people in indulgent societies versus lower percentage of very happy people in restraint societies, (2) a perception of personal life control in indulgent societies versus a perception of help-lessness in restraint societies, (3) higher importance of leisure in indulgent societies versus lower importance in restraint societies, (4) higher importance of having friends in indulgent societies versus lower importance in restraint societies, (5) more extroverted, optimistic personalities, and positive attitude in indulgent societies versus more neurotic, pessimistic personalities, and cynicism in restraint societies, (6) likelihood to remember positive emo-tions in indulgent societies versus a lower likelihood in restraint societies, (7) less moral discipline in indulgent societies versus restraint societies, (8) thrift is not very important in indulgent societies versus very important in restraint societies, and (9) indulgent societies are loose, while restraint societies are tight.

The values mentioned in points 1–6 and 8 are clearly associated with the SX personal dimension. This is due to the relationship they have with the personal lives of students, their way of relating beyond the academic field, and leisure activities, while points 7 and 9 are more conditioned to environments. Although these points are related to the personal SX dimension, they can be expanded to the other two dimensions of the SX. The value poles

"less moral" and "loose" societies versus "moral" and "tight" societies can be applied to the student–student, student–academician, and student–educational service relationships.

Table 6, built from the empirical analysis of the IVR elements, relates the general norm, personal feelings, and health values with the factors that make up the SX dimensions.

5. Student eXperience Model

The development of a SX model that incorporates cultural aspects consists of a four-stage process: (i) the development of an SLR to know the different definitions of SX, the interest areas, the dimensions/factors/attributes that make up the SX, and the methods used to evaluate the SX; (ii) the identification of factors and dimensions of the national culture in the literature. These elements were contrasted with those found in stage (i), referring to the SX dimensions; (iii) union of the factors and dimensions detected in the literature regarding the SX and the national culture; and (iv) the development of a model with the factors and attributes resulting from the union from stage iii. The model proposed in this stage can be refined based on the results of application of the proposed evaluation methods.

As a result of the fourth stage of the development process, a matrix was formulated that relates cultural and SX factors. This matrix was formulated based on an empirical association between the attributes that Hofstede used to define each cultural dimension and the factors of each dimension of SX [1,29], as can be seen in Section 4. This matrix reveals the SX factors that are involved in each cultural factor within the dimensions of Hofstede's cultural model. Figure 3 shows, in colored boxes, the cultural dimensions that are affected by certain SX factors. Striped boxes denote cultural dimensions that are not directly affected by factors from the SX dimensions.

The SX–cultural matrix establishes a transversal relationship between cultural aspects and SX at a conceptual level based on empirical information and previously validated models (Figure 3). It indicates that the factors that make up each of the cultural dimensions could have an impact on a certain element within the SX model. In this way, for example, when developing solutions related to the cultural dimension referring to the UA, it must be considered that this will have an impact on all the components of the three SX dimensions. In the same way, when working on solutions related to the PD, it must be taken into consideration that this has implications for elements related to the SX educational dimension, which are related to the perceived quality of the HEIs.

Table 7 presents the SX dimensions' formalization, detailing cultural aspects to consider in the analysis of the SX factors. For this, cultural factors were added to the description of each SX dimension. The inclusion of cultural factors derives from the SX–cultural dimensions relationship matrix.

The proposal can be utilized as a guide to elucidate what solutions should or should not be taken to solve specific problems in the educational field. If we want to implement solutions with a cultural approach, the elements of the SX that will be affected must be considered. Similarly, if we want to work on a specific SX aspect without harming migrants or exchange students, it should be considered what cultural aspects may be affected in the process.

Table 7. SX dimensions including cultural factors.

SX Dimension	SX Factor	Description
Social Dimension	Community Relationship Institutional Engagement	The SX Social Dimension is related to the student's Community Relationship within the campus and Institutional Engagement. In this dimension, interpersonal relationships within HEIs (student–student) and interactions with staff (student–administrative and student–educator) are observed. Interpersonal relationships are strongly influenced by the cultural background of the participants, in terms of social hierarchy, institutional hierarchy, gender, ethnicity, and values. This dimension also shows the students' feeling of institutional belonging/commitment. This feeling is strongly influenced by some cultural factors by the students, such as sense of group belonging, student–student communication, shared values with the HEIs, and personal objectives and motivations.
Educational Dimension	Learning Engagement Higher Education Quality Learning Resources/Learning Environment Educational/Support Services	The SX Educational Dimension is related to Students' Learning Engagement, Higher Education Quality, Learning Resources/Learning Environment, and Educational/Support Services. In this dimension, the aspects involved in the development of an adequate educational environment are observed. Mechanisms focused on maximizing the educational results of students (teaching methodologies, technological infrastructure, educational support networks) are also contemplated. These aspects imply a positive perception of the quality of the HEI, for which reason quality has been incorporated into this dimension. Perceived quality depends on customer satisfaction, which is based on their perceptions and expectations [49]. In turn, perceptions and expectations are influenced by students' culture, especially cultural factors related to teacher–student communication, student goals, competitiveness, and long-/short-term thinking.
Personal Dimension	Student Development and Outcomes Student Feelings and Emotions Environment Relationship Student Thoughts, Identity and Background	This dimension is related to Student Development and Outcomes, Student Feelings and Emotions, Environment Relationship, Student Thoughts, and students' Identity and Background. Personal aspects of each student's life that may influence interactions and perceptions with HEI services and products are considered. This dimension encompasses aspects directly related to culture, socioeconomic level, disabilities, personal aspirations, family structure, leisure, among others. This dimension is directly related to all the dimensions of Hofstede's model of national culture. This is because it is in the personal sphere of the student where they could manifest their cultural background in context-free social interaction.

6. Study Limitations

The development of our model considers the undergraduate HEI student as the main study subject. For this reason, any attempt to include subjects belonging to lower grades (e.g., primary or secondary education students) or higher grades (e.g., doctoral students) could lead to unsatisfactory results despite the possibility of them sharing certain needs and characteristics. In the same way, in later stages of our proposal, when we develop the scale and SX evaluation methodology, its validation will be in a specific context. For this reason, we plan to conduct field studies in several cultural contexts.

We must say that it is possible that our own cultural background and gender may have affected our perceptions when developing the model. Obviously, cultural and gender background may unconsciously affect subjects' perceptions and interactions. In future work, we plan to minimize, or even eliminate, this potential bias by inviting experts of different nationalities, cultures, and genders into the development and validation processes. We will include experts from national contexts other than Ibero-America (Latin America and Spain). This will be essential when incorporating a practical SX evaluation methodology and scale development into our theoretical model.

Regarding the MAS dimension of Hofstede's model, we should say that the cultural differences of the researchers who have addressed the gender issue have given rise to fierce criticism of the aspects and terms with which Hofstede addresses the female gender and its role in society. Despite the controversy around this dimension, experimental results of other models referring to the same aspects referred to in the MAS dimension show an undeniable correlation with it [44,45]. We decided to use Hofstede's original dimension as a reference because of its history of practical validation and its correlation with related dimensions of other national culture models.

7. Conclusions and Future Work

In this article, a theoretical SX model that considers cultural aspects was developed. This model is the result of the relationship between the factors that make up the SX dimensions and the cultural dimensions proposed by Hofstede [4,29]. In consideration of the cultural relationships identified, it is possible to use the SX model to have an idea of the impact that the solutions proposed may have, at a technical level, on the students involved.

With the relationship between the SX and national culture dimensions established, it will be possible to develop solutions for HE students that consider the cultural impact of technical proposals. With the proposed SX model, it would be feasible, for example, to develop tools that allow us to detect users' problems when interacting with digital systems in consideration of their cultural background [33].

Some possible solutions that can use our model are SX evaluation scales, design guides, or SX evaluation methodologies. It is important to mention that both the SX design and evaluation solutions have a direct impact on students' well-being and HEIs' perceived quality. This is due to the detection of failures and management improvements that result from the evaluation of the consumption experiences of the students, thereby improving their satisfaction.

This model is theoretical, as was mentioned in previous sections. This phase of the study deals with the model to know which components of the SX–culture model must be evaluated. Determining how to evaluate those components will be the next step of our work. In the next stage of our proposal, we will develop constructs associated with each dimension/factor, and examine the relationships between constructs, checking our SX model based on a Confirmatory Factorial Analysis (CFA) [50] and Structural Equation Modeling (SEM) [51,52]. The model will be further detailed and validated through the development of an SX evaluation methodology and a scale that incorporates items related to cultural aspects. For this, it will be applied practically. This methodology also contemplates the incorporation of cultural aspects in the evaluation methods to be used. Additionally, the emotional and affective aspects will be considered based on previous articles [26]. The evaluation methodology and scale will be carried out with test subjects and experts from different cultures, genders, and nationalities. In this way, we hope to minimize any bias that may be inferred in our study because our cultural or gender background. In addition, we plan to conduct field studies with our model in broader contexts than those it currently covers, i.e., Ibero-America.

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Article

Tourist Experience Challenges: A Holistic Approach

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Abstract: Tourist experience (TX) has been covered by many studies. However, a consensus on the topic still needs to be reached in terms of its dimensions, factors, evaluation methods, and evaluation models. Moreover, the COVID-19 pandemic severely affected the tourism sector, and the post- pandemic era could bring about new challenges and opportunities, such as the growing awareness of the need for greener, more sustainable, and more balanced tourism. In this study, we consider TX a particular case of customer experience (CX) and an extension of the user experience (UX) concept. We conducted a systematic literature review addressing the concept of TX and reviewing articles published from 2012 to April 2023, indexed in two significant and relevant databases (Web of Sciences and Science Direct). We addressed research questions concerning (1) TX definition; (2) TX dimensions, attributes, and factors; (3) methods used to evaluate TX; and (4) the post-pandemic TX. We selected and thoroughly analyzed 167 articles. We analyze the TX concept, models, evaluation, and the post-pandemic context. We propose a holistic definition of TX and recommend ways to achieve its better analysis. Lessons learned during the COVID-19 pandemic may be helpful when dealing with future challenges and crises.

Keywords: tourist experience; customer experience; tourist experience model; tourist experience evaluation; COVID-19 post-pandemic tourist experience

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1. Introduction

The World Tourism Organization (UNWTO) defines tourism as "a social, cultural and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or business/professional purposes" [1]. Tourism is an intangible commodity that is continuously evolving. Virtual channels replace traditional channels for tourism promotion/sales/feedback. The global COVID-19 pandemic dramati- cally affected tourism, which at one point became almost impossible, with virtual tourism being the only option. In May 2023, the World Health Organization (WHO) declared that COVID-19 was no longer a public health emergency of international concern [2]. The WHO indicated that this "does not mean the pandemic itself is over, but the global emergency it has caused is, for now". The tourism sector seems to be fully recovering to its pre-pandemic levels. However, new challenges are becoming evident, such as overcrowding and the need for more sustainable tourism. Lessons learned during the pandemic may serve when dealing with future crises.

Many authors have discussed tourist experience (TX) as a concept. However, there still needs to be more consensus on its definition for several reasons, namely the subjectivity of the issue, how personal the tourist experience can be, and how multidimensional it is [3]. Scholars agree that TX spans across a period that begins when the tourist is planning a trip and continues even after this trip occurs through memories about the acquired activities

and learning. Tourism is an intangible commodity, and TX is the result of accumulated experiences and memories related to travel [4].

Customer experience (CX) is a key concept in service science. It is highly interdisciplinary; originally proposed in marketing, it has lately raised interest in several fields. Laming and Mason (2014) highlight that CX includes a customer's responses before, during, and after interacting with a brand/company during their whole "journey" [5]. TX may be considered a particular case of CX. Tourists are specific types of customers that use tourism-related services, products, and systems. However, general CX definitions do not cover the specificity of TX. We examined TX as a particular case of CX in previous works, identifying scenarios and touchpoints [6–8]. TX is strongly related (but not limited) to the services' quality.

CX can be considered an extension of user experience (UX), a well-known and highly explored topic in human–computer interaction (HCI) [9]. CX focuses on a person's interaction with all services, systems, and products that a company/organization/brand offers instead of focusing on the interaction with a single product, system, or service, as UX does. The ISO 9241-210 standard defines UX as "the perceptions and responses of the person resulting from the use and/or anticipated use of a product, system, or service" [10]. The definition covers software systems and can be applied to tourism-related products, systems, and services. We think that UX is an excellent approach to TX. We have focused on UX tourism-related digital products, especially online travel agencies [11–14], virtual museums [15–17], and national parks [18]. We have also used a broader, holistic approach to TX from a CX point of view [3,19–21].

Companies are increasingly aware that CX plays a key role in determining success. A good CX may increase customer attraction and retention. CX evaluation is therefore critical in order to understand how customers perceive a company/organization and its products/systems/services. We think that assessing TX, as well as CX, is challenging for several reasons: TX is constructed through touchpoints of different natures, and it is likely that the experience at one touchpoint may (highly) influence experiences at subsequent touchpoints; TX is multidimensional; and TX is highly personal [13]. In order to properly design and evaluate TX, we must first understand what TX is and which TX dimensions/factors/attributes are relevant.

Relevant research has been carried out on TX, especially over the last decade. However, there is still no agreement on the concept, its dimensions, and evaluation. Moreover, despite the huge impact of the COVID-19 pandemic on tourism, studies on TX and COVID-19 are still scarce and limited to specific contexts. In order to identify the research trends and gaps, we have performed a systematic literature review of studies published from 2012 to 2022 (until April 2023). The objectives of our study are to identify and in-depth analyze (1) TX definitions, (2) TX dimensions, (3) TX evaluation methods, and (4) the COVID-19 pandemic TX. We have focused our search on two significant databases: Science Direct and Web of Science. We have used a holistic approach to TX, which we consider a particular case of CX and a highly interdisciplinary topic. We found several TX definitions, and we propose a holistic definition of TX. Scholars propose a variety of TX dimensions; this confirms its multidimensional nature. The results show that most studies use scales when evaluating TX and its antecedents and consequences. Most of the studies utilize a quantitative approach to assess TX. However, holistic TX evaluations should focus on all (or at least the most relevant) touchpoints, dimensions, and context. Even if COVID-19 is no longer a global emergency, several lessons learned during the pandemic may be helpful when dealing with future challenges and crises.

2. Background

2.1. User Experience

UX is a well-known concept in HCI. The Association for Computing Machinery (ACM) Special Interest Group on Computer–Human Interaction (SIGCHI) declares its scope to be "the study and practice of the design, implementation, use, and evaluation of interactive

computing systems" [22]. However, the UX definition in ISO 9241-210 standard indicates that UX is not restricted to the use of interactive software systems but applies to any product, system, or service [10]. Therefore, the UX concept is also useful when studying tourists' interactions with tourism-related products, systems, or services. In tourism, UX refers to tourists' emotions, expectations, responses, and behaviors before, during, and after they use such products, systems, or services.

2.2. Service Science and Customer Experience

Maglio and Spohrer (2008) consider service science to be "the study of service systems, which are dynamic value co-creation configurations of resources (people, technology, organizations, and shared information)" [23]. Service science is a highly interdisciplinary field that combines organizational, human, business, and technological understanding, to explain service systems, including how they interact and evolve to co-create value [24]. Schmitt (1999) proposes a shift from traditional marketing to experiential marketing as "products, communications, and marketing campaigns that awaken senses and reach the heart of the consumer, that they manage to generate a type of stimulation in people" [25]. He identified a set of strategic experiential modules: sensory experiences, affective experiences, cognitive experiences, physical experiences, behaviors and lifestyle, and social-identify experiences.

CX has become a key concept in service science in recent decades. Several CX definitions have been proposed, but no agreement exists on the CX concept. Laming and Mason (2014) indicate that CX includes "the physical and emotional experiences occurring through the interactions with the product and/or service offering of a brand from the point of first direct, conscious contact, through the total journey to the post-consumption stage" [5]. Joshi (2014) also stresses that CX is a sum of experiences when there is a service relationship between the customer and the company [26]. LaSalle and Britton (2003) have a similar approach to CX, which in their view, is generated by the set of interactions between the customer and a product, a company, or part of its organization, which provoke customers' reactions [27].

Meyer and Schwager (2007) indicate that CX is built through "touchpoints", the points in time when customers are "touching" any product, service, or system that a brand offers across multiple channels, and experiences are generated [28]. Stein and Ramaseshan (2016) have identified seven types of elements present at touchpoints: atmospheric, technological, communicative, process, employee–customer interaction, customer–customer interaction, and product interaction [29]. Vanharanta et al. (2015) emphasize that CX is a holistic concept that involves subjective experiences and includes customers' rational thoughts and emotions [30]. Scholars have proposed several CX models. Gentile et al. (2007) synthesized a comprehensive set of CX dimensions: sensorial, emotional, cognitive, pragmatic, lifestyle, and relational [31].

We agree with Lewis's approach to CX as an extension of the UX concept [9]. In our view, UX focuses on a person's interactions with a single product, system, or service; CX offers a holistic approach, focusing on a person's interactions with all products, systems, or services that a company (institution, brand) offers throughout their whole "journey" as a customer. CX is undoubtedly more complex than UX.

2.3. Tourism Experience

There still needs to be a consensus on TX definition, dimensions, evaluation, and management. TX may be considered a particular case of CX; tourists are specific types of customers who use tourism-related services, products, and systems. However, general CX definitions may not cover TX specificity.

A wide range of TX dimensions have been identified by different authors. Most of them are related to CX models. Pine and Gilmore (1998) identified four dimensions ("realms") of experiences: entertainment, educational, escapist, and esthetic [32]. Their "4Es" model is still used in many TX studies. They argued that the economy had been switched from a service-based approach to an experience-based one. They have also

pointed out the need to design "memorable" experiences that will be remembered and recalled after the event has occurred. This later defined the memorable tourist experience (MTE) concept. Instead of MTE, we will consistently use the abbreviation MTX to highlight the strong relationship between TX (and its variants, as MTX), CX, and UX. Walls et al. (2011) proposed a "framework of factors" that influence TX: individual characteristics, perceived human interactions in the destination, and situational factors [33].

Ritchie and Hudson (2009) identified six "streams" in TX research: conceptual, oriented to tourist behavior; methodological, oriented to specific kinds of tourism; and managerial, oriented to levels/types of experiences [34]. Understanding TX and its dimensions/factors is critical to evaluating, designing, and managing TX. Thompson (2018) indicated some key issues in CX research: underestimating qualitative research and emphasizing only quantitative research, correctly integrating and interpreting data, and the disconnection between evaluation and design [35]. We think that the same challenges are also present in TX research.

3. Research Method

This systematic literature review (SLR) was performed guided by the framework for literature review proposed by Kitchenham (2004) [36], which includes three stages: (1) plan- ning the review, (2) conducting the review, and (3) reporting the review. Additionally, we have incorporated the PRISMA methodology checklist into our review [37].

3.1. Research Questions

We focused our study on (1) TX definitions, (2) dimensions and factors regarding TX, (3) methods that are used to evaluate TX, and (4) the COVID-19 (post-)pandemic TX context. Table 1 presents the four research questions (RQ) that guided our study.

Table 1. SLR Research Questions.

ID	Research Question
RQ1	What is TX?
RQ2	What are the TX dimensions and what factors influence TX?
RQ3	What methods are used to evaluate TX?
RQ4	How is the post-pandemic TX?

3.2. Literature Search

We examined the literature published within the last decade (from 2012 to April 2023) and indexed in two databases: Web of Science (WOS) and Science Direct (SD). We used the search string '"tourism experience" OR "tourist experience" OR "touristic experience"'. Initially, we also searched for studies indexed in other relevant databases, such as Scopus. However, we later decided to focus only on WOS and SD for two reasons: (1) to keep information manageable, as, for instance, in Scopus, we found almost 4000 studies; and (2) most of the studies indexed in WOS and SD were published in journals and were submitted to a rigorous reviewing process. Both the number and the percentage of studies available in each database are listed in Table 2.

Table 2. SLR results by database.

Database	Number of Studies	% of Studies
Web of Science	1399	69.6%
Science Direct	610	30.4%
Total	2009	100%

3.3. Study Selection

The inclusion and exclusion criteria are presented in Table 3.

Table 3. SLR inclusion and exclusion criteria.

ID	Category	Criteria
IN1	Inclusion	Articles published in the last decade (from 2012 to April 2023)
IN2	Inclusion	Articles referring to at least one research question
EX1	Exclusion	Remove duplicated articles

We gathered 167 articles for a full review by applying the selection criteria. Figure 1 shows the search and selection process flow, using the inclusion and exclusion criteria and removing duplicates. Only articles in English were reviewed.

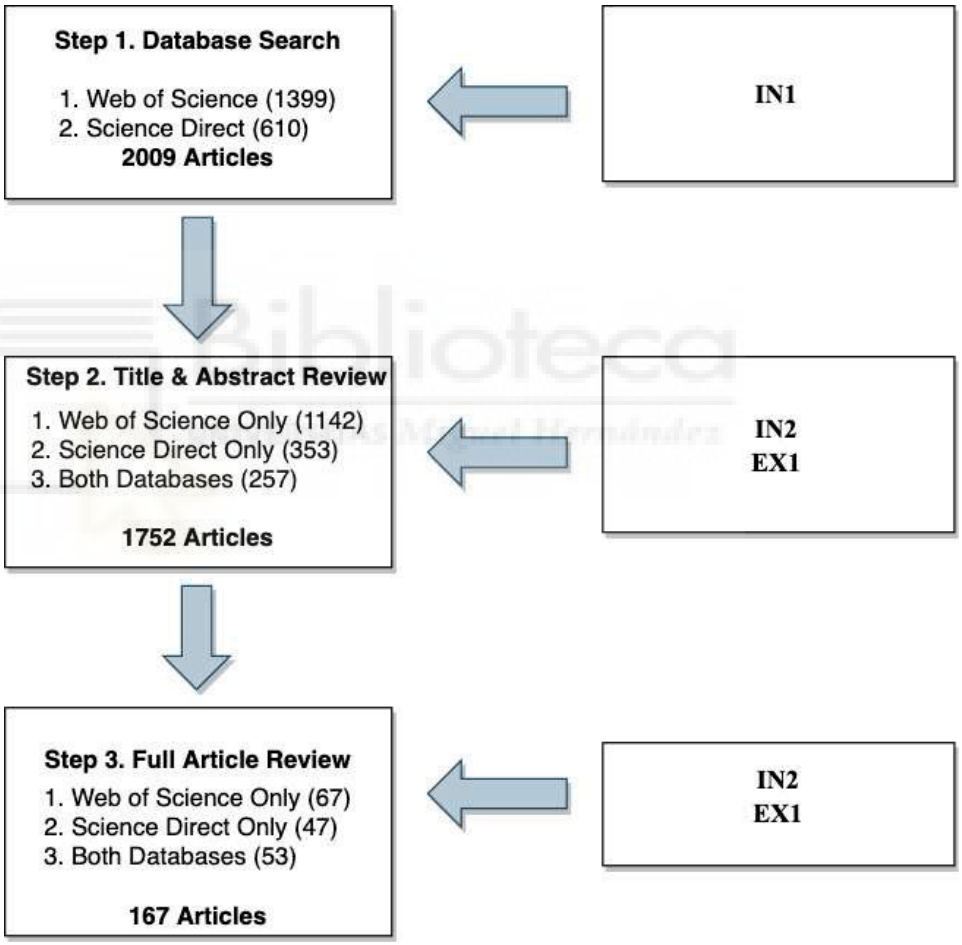

Figure 1. Flow chart with the results of the study selection process.

4. Data Synthesis

This section includes the data synthesis for the selected studies, identifying (i) publications over the years, (ii) document type and associated subject area, and (iii) distribution of selected articles by database.

4.1. Year of Publication

Figure 2 indicates an increasing interest in TX research. Information regarding 2023 is highlighted in a distinct color, as it was collected in April 2023; it is very likely that the total number of studies to be published in 2023 will be significantly higher.

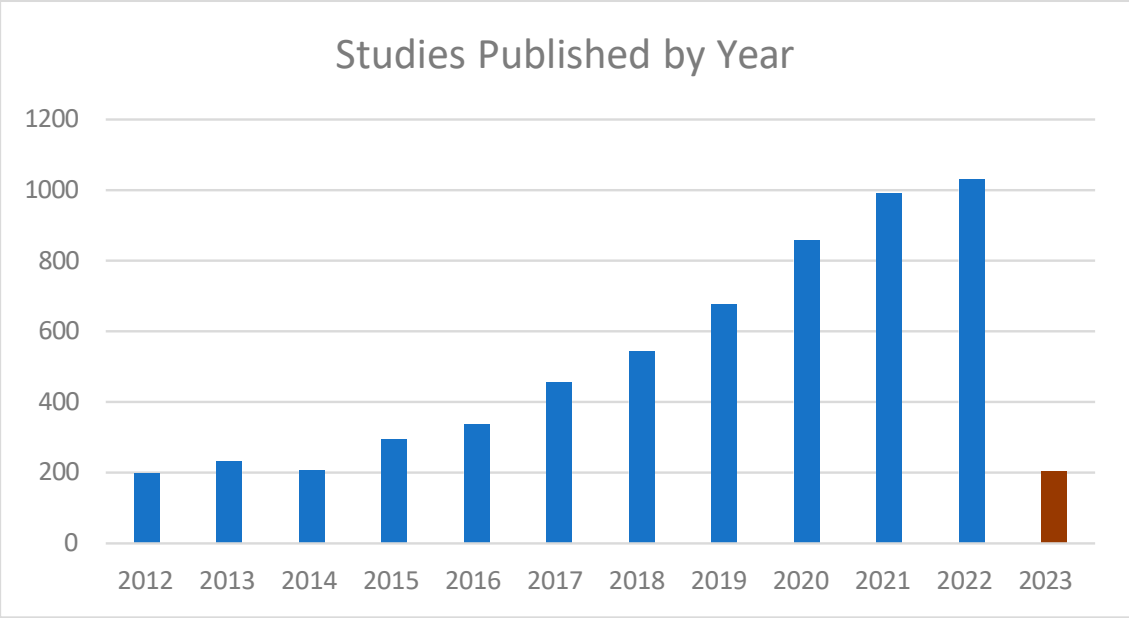

Figure 2. Research on the TX area over the years.

4.2. Total Studies by Database

As seen in Figure 3, of the 1752 articles identified based on the search string (after removing duplicated), 65.2% were indexed only in WOS, 20.1% were indexed only in SD, and 14.7% were indexed on both databases.

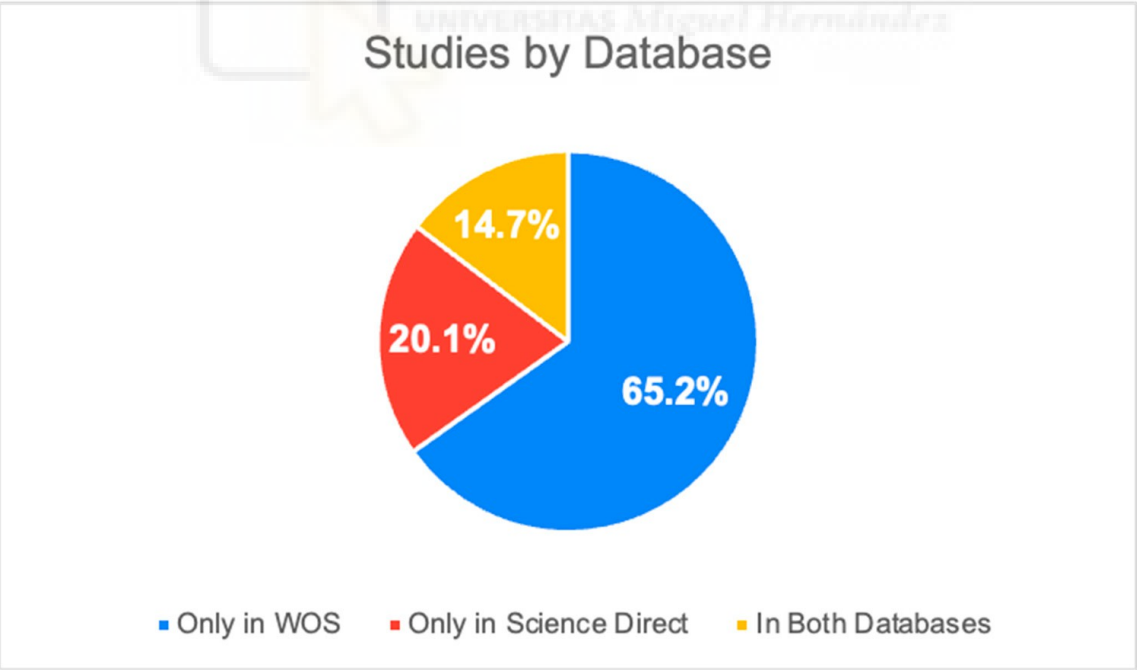

Figure 3. Studies number per database.

4.3. Document Type and Subject Area

Figure 4 shows that most documents correspond to articles: 1319 in Web of Science and 551 in SD. Classification areas differ in WOS and SD, but most are associated with hospitality, business and management, and social sciences.

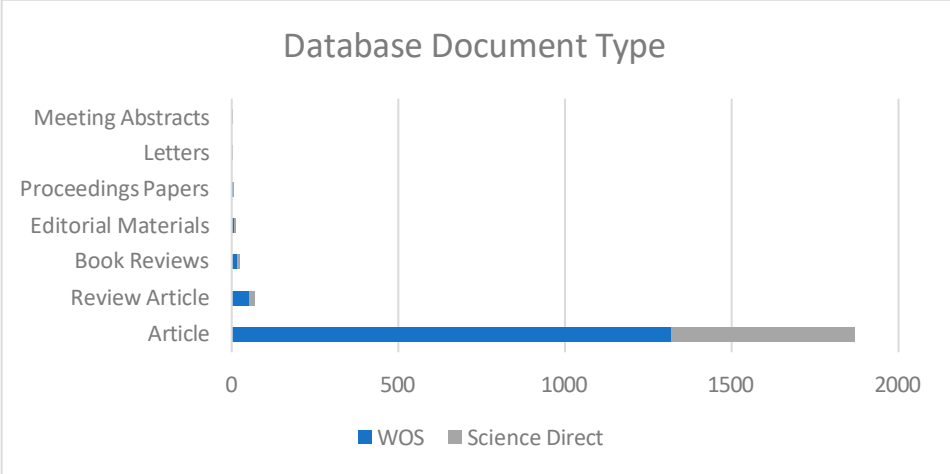

Figure 4. Document type by database.

4.4. Selected Studies by Database

As seen in Figure 5, of the 167 selected studies for full review, 40.1% were indexed only in WOS (67), 28.1% were indexed only in SD (47), and 31.8% were indexed in both databases (53). Compared to the first step of the selection process, the percentage of studies selected in step 3 and indexed in both databases increased, and the distribution of studies by database was more balanced.

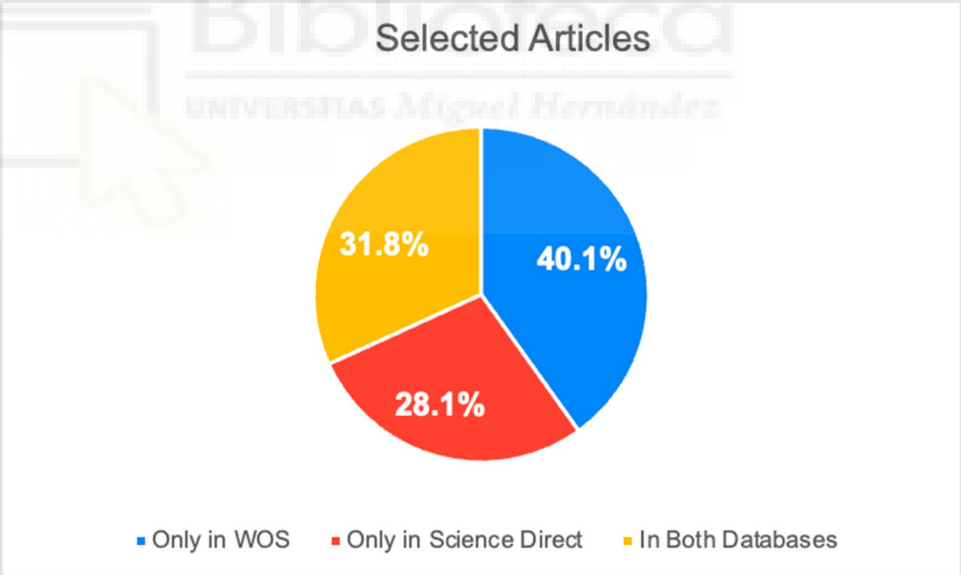

Figure 5. Selected articles by database.

5. Research Questions

5.1. RQ1: What Is TX?

Godovykh and Tasci (2020) highlight the need for a consensus on the CX concept [38]. They propose a holistic definition of experience: "the totality of cognitive, affective, sensory, and conative responses, on a spectrum of negative to positive, evoked by all stimuli encountered in pre, during, and post phases of consumption affected by situational and brand-related factors filtered through personal differences of consumers, eventually resulting in differential outcomes related to consumers and brands". Even if their definition refers to experiences in tourism and aims to include all TX-relevant aspects, it does not limit to TX. It may apply to experiences in other fields.

Sugathan and Ranjan (2019) indicate several reasons why experiences in tourism differ from consumption experiences in general [39]: (1) tourism services are highly experiential, and their utility is not readily observable; (2) tourism companies presume that they have the expertise to maximize tourists' experiences; (3) TX occurs in distinct stages (planning the event, experiencing the destination, and constructing narratives after returning); (4) co-creation can occasionally impede value creation, leading to dampening of TX; and (5) novelty is a primary motive for tourists, and they may not want to return to the same place, even when having good TX. Mendes et al. (2022) examine tourism as a service to enhance TX [40]. Jensen et al. (2015) argue that TX is about how meaning is created and highlight that meaning creation includes individual, social, and cultural meanings [41]. Tregua et al. (2020) identify five perspectives on TX literature [42]: firm-inspired, technology-based, cultural-based, innovation-based, and customer satisfaction and participation.

Kim et al. (2012) consider that a positive, memorable tourism experience (MTX) is "a tourism experience positively remembered and recalled after the event has occurred" [43]. Kim (2014) highlights that tourists' experiences at the destination determine their satisfaction and may generate MTX [44]. In their systematic literature review on MTX, Hosseini et al. (2021) cite its "initial definition" given by Kim et al. (2012) [45]. They highlight that not all experiences are memorable. Chen et al. (2020) show in their review that most of the MTX literature published from 2012 to 2021 focuses on MTX and tourist behavior and the Kim et al. (2012) MTX scale. Earlier studies focused more on TX, while later studies focused more on satisfaction, marketing, and service innovation. They think that MTX research should use a more customer-centered approach.

Servidio and Ruffolo (2016) described MTX as "an important event stored in the memory and recalled after it has occurred" [46]. They indicate that memory is partially neglected in TX studies. Zhang et al. (2018) highlight that MTX and TX are related yet different concepts "in connotation and extension"; not all TXs convert into MTXs [47]. Bigne et al. (2020) compare MTX with "ordinary" TX (OTX) [48]. They consider the non-MTX as ordinary OTX. Anaya and Lehto (2023) focus on memorable tourism moments (MTMs) [49]. Coelho et al. (2018) attempt to identify the core processes that are sense-making and meaningful in MTX [50]. They highlight that studies on MTX have three perspectives: expansive, managerial/economic, and modeling. They conclude that it may be more enriching to identify MTX components rather than focusing on what makes an experience memorable. Park and Santos (2016) highlight that what tourists most recall in the post-travel stage are unique and unexpected personal experiences [51].

Lu et al. (2015) focus on tourists' satisfaction to assess TX [52]. Sarra et al. (2015) think that the future of any tourist product and service depends on the perceived quality of TX [53]. Altunel and Erkut (2015) consider TX to be the quality of experience concerning tourism [54]. On the contrary, Fernandes and Cruz (2016) consider experience as "a far broader and less delimited concept than product or service quality", and they think a holistic approach to TX is still missing [55].

Brunner–Sperdin et al. (2012) indicate that scholars focus on cognitive components, neglecting emotional aspects of customer satisfaction [56]. Fall Diallo et al. (2022) emphasize that TX is highly personal [57]. Volo (2021) highlights the role of emotions in tourists' cognitive evaluations and behavioral responses [58]. Lin and Kuo (2016) identify the psychological process through which TX generates perceived value, which creates satisfaction, and satisfaction is a dominant antecedent of loyalty intentions [59]. daSilva et al. (2021) synthesize the subjective optimal experience (flow) in TX [60]. Nawijn and Biran (2018) point out that TX research should also focus on negative emotions, not only on positive emotions [61]. Meacci and Liberatore (2018) highlight the role of the senses in TX [62]. They argue that each touchpoint of TX has a specific sensory dimension, and a holistic multisensorial approach should be applied when designing TX.

Wang et al. (2014) emphasize that travel is a process that includes three stages: pre-trip, during-trip, and post-trip [63]. Stienmetz et al. (2021) explore the complex nature of TX,

which occurs through discrete (moment-to-moment) yet summarized events [64]. Björk et al. (2020) highlight that TX has been lately one of the most addressed topics of Nordic TX research and emphasize the 3 phases of travel [65]. Aybek and Ozdemir (2022) indicate that the ethnic restaurant experience should be considered a processual activity [66]. Unger et al. (2016) analyze the business travel experience in 4 phases: trip preparations, passenger experience, destination experience, and homecoming [67].

Teoh et al. (2021) acknowledge that TX can have transformative attributes, identifying three dimensions of transformative TX: experience, experience-facilitator, and experience-consumer [68]. Inversini et al. (2022) highlight the transformative power of TX and its potential to generate significant change and impact on individuals' self while on vacation [69]. Chang et al. (2021) focus on the creative aspects of experiences in tourism [70]. Cao et al. (2023) stress the role of co-creation in TX [71]. Campos et al. (2015) propose a psychology-based definition of on-site co-creation TX [72]. Yamashita (2015) argues that the "authentic" TX is impossible nowadays, as, in the pre-travel stage, tourists already collect information on what they will experience [73]. Verma et al. (2022) see virtual tourism as "the future of tourism", revolutionizing TX without traveling [74]. Huang and Choi (2019) focus on tourist engagement [75]. Weaver et al. (2017) also stress the importance of effective engagement [76].

Koç et al. (2022) point out that other tourists can influence one's TX positively through co-creation or negatively through co-destruction [77]. Uysal et al. (2016) indicate that the impact of TX on the quality of life depends on stages in life and other background variables that influence the degree of importance of travel [78]. Miyakawa and Oguchi (2022) examine the family TX [79]. They stress the beneficial effects of family tourism on parents' well-being and their children's generic skills.

Tan (2017) highlights the link between the physical and virtual spaces connected through the smartphone [80]. Kabadayi et al. (2021) indicate that smart services can improve TX [81]. Femenia-Serra and Neuhofer (2018) conclude that experiences in smart destinations are data-driven, built-in in real-time, based on context awareness, and co-created [82].

Sedgley et al. (2017) study the TX of mothers of children with autism spectrum disorder (ASD) [83]. They analyze the challenges of caring for children with ASD on holiday and the perceived benefits of holidays. Olson and Reddy-Best (2019) highlight that transgender and gender non-conforming individuals often feel fear and anxiety about sharing their gender identity in identification, security thresholds, and check-in procedures [84].

Dodds (2020) proposes a model of TX's "lifecycle", indicating that a tourist may transit through four stages: excitement, novelty, normalization, and familiarity [85]. Cajiao et al. (2022) identify four motivations of Antarctic tourists: experience and learning, adventure, social bonding, and the lifetime trip [86]. Pafi et al. (2020) argue that TX of coastal landscapes needs to be understood from a community-led rather than market-led perspective [87]. Suhartanto et al. (2021) indicate the need to examine TX holistically in halal tourism, including leisure experience and fulfilling religious requirements [88].

Tussyadiah (2014) suggests three fundamentals in TX design [89]: human-centeredness, iterative designing process, and a holistic experience concept as an outcome of designing. Eide et al. (2017) insist on maintaining innovation over time when managing TX [90]. They refer to the "maintenance of experience concept innovation", as keeping the expe- rience attractive and "alive" over time. Soler and Gemar (2017) conclude that tourism management is responsible for TX quality [91]. Van der Zee et al. (2017) recognize that a "network approach" in tourism management is likely to improve TX [92]. Ferguson et al. (2017) indicate that tipping or non-tipping behavior predictor could enable better TX management [93].

Table 4 synthesizes the approaches to the TX concepts and some of the studies associated with each approach.

Table 4. Approaches to the TX concept.

Approach	Studies
Conceptual	[38–42]
Memorable	[43–51]
Satisfaction	[52–55]
Psychology, Senses, and Emotions	[56–62]
Process	[63–67]
Transformative	[68,69]
Creative	[70–74]
Engagement	[75,76]
Influences	[77–82]
Special needs and Tourist segments	[83–88]
Management	[89–93]

In our view, the definition of Godovykh and Tasci is holistic and attends to most of the concerns expressed by Sugathan and Ranjan. It also follows at least two of the TX perspective identified by Tregua et al., i.e., brand-related and customer-related. The definition refers to a brand, but a trip usually involves several brands (companies, organizations). We think TX may be referred to as the cognitive, affective, sensory, and conative subjective perceptions, either negative or positive, and affected by situational factors, that a tourist has when interacting with brands, pre-, during, and post-travel, including their outcomes.

The focus on MTX in many studies is remarkable—however, TX range from negative to positive. Considering the OTX as the opposite of MTX normalizes the possible (very) negative TX. TX should have a human-centered approach and attend to the whole range of experiences, negative, ordinary, and memorable. The link between service quality, satisfaction, and TX is obvious and empirically confirmed by many studies. We agree that TX is more than service quality and satisfaction; a holistic approach to TX is necessary. Conceptual research is essential, but all assumptions should be tested empirically. The emotional aspects of TX are certainly equally crucial as the cognitive ones. A holistic approach to TX should be multisensorial and include positive and negative emotions.

The impact of co-creation and tourist engagement in TX was emphasized in several studies, and the search for authenticity is recurrent when studying tourist motivation. However, opinions range from considering authentic TX as impossible nowadays to assuming that virtual tourism is the future. The effect of tourist-to-tourist interactions on TX has been recognized as negative or positive (in the case of family tourism). The authors agree on the highly personal and subjective nature of TX, but only some studies focus on tourists with special needs.

Many authors highlight that TX is constructed through three stages (pre-, during, and post-travel) and stress the importance of analyzing the whole process. This is consistent with the CX approach to TX, where the moment-to-moment events proposed by Stienmetz et al. are, in fact, touchpoints where tourist interacts with tourism-related products, systems, or services. Several studies focus on the positive impact of technologies on TX: smartphones, smart services, and smart destinations. However, they are not linking UX and TX. This link is necessary for a couple of reasons: (1) CX and TX are extensions of UX, and (2) the use of technologies in tourism is continuously increasing. Therefore, even if UX were to focus only on tourists' perception of "smart" tourism, its relationship with TX is undeniable.

5.2. RQ2: What Are the TX Dimensions and What Factors Influence TX?

Fernades and Cruz (2016) indicate the lack of research on CX "measurement", and its underlying dimensions; in their view, CX dimensions have only been assumed but not yet "extracted" [55]. Godovykh and Tasci (2020) identify the four most frequently explained components of experience: affective, cognitive, conative, and sensorial [38]. They indicate that scholars use different terminology when referring to the same concept. Chen et al. (2020) use four MTX stimuli (psychological experience factors): hedonism, novelty,

meaningfulness, and social interaction: [94]. Moliner et al. (2019) propose a TX model with five dimensions: cognitive, affective, behavioral, sensory, and social [95]. Su et al. (2022) use seven dimensions of TX: sensory, feeling-based, behavioral, knowledge, authenticity, co-creation, and novelty [96].

Escobar et al. (2019) identify 11 factors of delightful TX that they group into two dimensions: cognitive and affective [97]. Huang and Liu (2018) consider four dimensions of the effects of a creative experience: peace of mind, escape, unique involvement, and interactive opportunities [98]. Zatori et al. (2018) identify four dimensions of on-site TX [99]: emotional, mental, flow-like, and social experience–involvement. Chen et al. (2022) consider four TX dimensions: sensory experience, action experience, emotional experience, and thinking experience [100].

Kim et al. (2012) have developed a memorable tourist experience (MTX) scale that includes seven dimensions [43]: hedonism, refreshment, local culture, meaningfulness, knowledge, involvement, and novelty. The dimensions that they have proposed were used by many other scholars when developing TX(-related) scales. Kim (2014) identifies 10 dimensions that affect MTX [44]. Bigne et al. (2020) synthesize eight MTX dimensions based on other scholars' studies [48]. Luo et al. (2020) propose seven dimensions for entertainment TX [101]. Coelho et al. (2018) acknowledge that Kim et al. developed one of the most widely used MTX, but they propose only three MTX dimensions: personal, relational, and environmental. Hosseini et al. (2021) synthetize the MTX dimensions mentioned in literature from 2012 to 2021 [45]. They find that the most recurrent dimensions from 2012 to 2014 are the ones that Kim et al. use in their MTX scale. They indicate that, from 2015, new dimensions such as behavioral intention, destination image, loyalty, satisfaction, word-of-mouth (WOM) intention, and revisit intention have been studied. They pointed out that starting in 2018, most studies began to focus on antecedents and consequences of MTXs and consider the MTX scale dimensions to be interdependent; new factors were considered, such as the environment, destination attributes, and personal and social considerations.

As proposed by the studies under review, TX dimensions are synthesized in Table 5.

Table 5. TX dimensions.

Dimensions	Studies
Affective	[38,95–97,99,100]
Cognitive	[38,95,97]
Conative	[38]
Sensorial	[38,95,96,100]
Behavioral	[45,95,96]
Social	[95,99]
Knowledge	[43,45,48,96]
Authenticity, Co-creation	[94,96]
Novelty	[43,45,48,96,101]
Peace of mind, Interactive opportunities	[98]
Escape	[98,101]
Involvement	[43,45,48,98,101]
Mental, Flow-like	[99]
Action, Thinking	[100]
Hedonism, Meaningfulness	[43,45,48,94]
Refreshment	[43,45,48,101]
Local culture	[43–45,48,101]
Environment management	[44,50]
Variety of activities, Hospitality, Infrastructure, Accessibility, Quality of service, Physiography, Place attachment, Superstructure	[44]
Serendipity and surprises	[48]
Learning, Enjoyment	[101]
Personal, Relational	[50]
Destination image, Loyalty, Satisfaction, Word-of-mouth intention, Revisit intention	[45]

Several studies analyze the antecedents and consequences of TX. Zhang et al. (2018) have examined the relationship between the country and destination image, MTX, and

revisit intention [47]. In their study on the perceived coolness of "Generation Y" (born between 1977 and 1994) in the context of creative tourism, Chen and Chou (2019) propose a model of creative TX [102]. The model includes three antecedents and three consequences of perceived coolness. Kim et al. (2021) study the impact of mobility on MTX [103]. Ruiz et al. (2021) evaluate the effect of crowding on tourist satisfaction [104]. Shaykh– Baygloo (2021) examine the relationships between a sense of place, the perceived quality and value of attractions, and tourists' satisfaction [105]. Kirillova et al. (2014) indicate that the importance of the aesthetic attributes of a destination is widely accepted. Still, it is usually reduced to a single-dimensional variable such as "the place is beautiful" [106]. Koç et al. (2022) have studied the relationship between negative tourist-to-tourist interaction, tourist emotions, and intention to recommend [77].

Various studies propose specific, domain-related TX dimensions. Chang and Hung (2021) identify seven dimensions of cultural and creative tourism [107]. Gardiner et al. (2022) identify five factors ("realms") that influence the attitudes toward recreated historical tourism experiences [108]. When analyzing TX in Lisabon, Sarra et al. (2015) focus on three aspects [53]. Pafi et al. (2020) identify five types of landscape experiences in coastal tourism [87]. Sthapit et al. (2022) propose a model of memorable nature-based TX that includes five dimensions [109]. Tang et al. (2021) propose a model for urban Chinese forest recreationists with five dimensions [110]. Lin et al. (2022) analyze TX in Haizhu National Wetland Park, China, using five dimensions [111]. Chen et al. (2023) study the relationship between rural TX and tourists' post-experience green consumption intention based on the 4Es model of Pine and Gilmore [112]. Liu et al. (2023) study the well-being of TX in China based on the same four TX dimensions [113]. In their study on an island destination (Jeju Island, South Korea), Moon and Han (2018) also consider only four TX dimensions [114]. Lee and Han (2019) consider seven dimensions when proposing a scale for the low-carbon tourism experience [115]. Cajiao et al. (2022) study the Antarctic TX based on two dimensions and six sub-dimensions [86]. When looking at the emotional influences of rural travel on family cohesion, Lee and Lee (2021) used five dimensions of the MTX scale of Kim et al. [116]. Voon et al. (2017) propose nine dimensions of TX in homestays (in Malaysia) [117]. Suhartanto et al. (2020) propose five dimensions for agritourism TX [118]. Komppula et al. (2016) study TX during social holidays in Finland, identifying five factors for the social TX [119]. Olivier et al. (2022) propose a model of TX in periodic hallmark festivals that they call PHF-TX; it includes six dimensions [120]. Suhartanto et al. (2021) identify five dimensions of holistic halal TX [88]. In their study on senior tourists, Sie et al. (2021) consider four factors of MTX [121]. Martins et al. (2017) argue for the importance of the use of technology in tourism and propose a "multisensorial virtual-reality tourism model", with five stimulus-related "blocks" [122]. Table 6 shows domain-related cases of TX dimensions.

Fernades and Cruz explicitly state the need for more research on CX dimensions (and consequently on TX dimensions). We consider as "dimensions" the main components of TX and as "factors" their sub-categorizes (sub-dimensions). However, the line between dimensions/factors/attributes is quite blurred in many studies. Godovykh and Tasci identify four main TX dimensions: affective, cognitive, conative, and sensorial; however, they also indicate that these dimensions are frequently referred to under different names. The four components are recurrent in most of the TX models. Kim et al. define a set of seven MTX dimensions that have subsequently been used by other scholars: hedonism, refreshment, local culture, meaningfulness, knowledge, involvement, and novelty.

The most recurrent TX models the studies are based on are the MTX seven-dimension model of Kim et al. and the 4Es four-dimension model of Pine and Gilmore. As Hosseini et al. indicate, TX's new dimensions and factors have lately been proposed. It is worth mentioning that the same constructs are considered in some studies as TX dimensions and in others as antecedents or consequences of TX. The limit between TX, its antecedents, and its consequences is indistinct. When studying domain-related and particular cases of TX, the spectrum of dimensions and factors is very ample.

Table 6. Domain-related TX dimensions.

Domain	Dimensions	Studies
Cultural and creative tourism	Learning, Recreation, Exhibition, Service, Food, Facilities, and Souvenirs	[107]
Recreated historical tourism	Education, Entertainment, Escapism, Aesthetics and Staged authenticity	[108]
Cultural city	Mobility, Destination image, and Level of knowledge and appreciation of tourist areas	[53]
Landscape experiences in costal tourism	Well-being experiences, Conscientious travel experiences, Nature experiences, Coastal change experiences, and Cultural experiences	[87]
Nature-based tourism	Novelty, Experiencescape, Experience co-creation, Experience intensification, and Satisfaction	[109]
Urban forest recreationism	Destination image, Recreational benefits, Satisfaction, Perceived value, and Behavioral intentions	[110]
Wetland Park	Travel cost, Escape experience, Parent–child experience, Activity experience, and the Crowded perception	[111]
Rural tourism	Education, Esthetic, Entertainment, and Escapism	[112]
Well-being	Educational, Entertainment, Esthetic, and Escapist	[113]
Island destination	Escapism, Relaxation, Enjoyment, and Involvement	[114]
Low-carbon tourism	Sensory experience, Affective experience, Learning experience, Sociocultural experience, Behavioral experience, Escapism experience, and Prestige experience	[115]
Antarctic tourism	Experiential (Perceived learning, Measured learning, and Satisfaction), and Pro-environmental (Environmental concerns, Management preferences, and Behavior intentions)	[86]
Family rural travel	Refreshment, Novelty, Arousal, Meaningfulness, and Involvement	[116]
Homestays	Culture, Guiding, Accommodation, Services, Food and beverages, Journey, Natural environment, Access, and Cleanliness	[117]
Agritourism	Uniqueness, Learning, Staff, Escape, and Peace-of-mind	[118]
Social tourism	Interaction, Physical environment, Content of the activities, Food and mealtime conditions, Situational factors, and Personal factors	[119]
Periodic hallmark festivals	Emotional value, Functional value, Monetary value, Social approval value, Self-image congruency value, and Safety value	[120]
Halal tourism	Halal experience (halal accommodation, and halal facility and service), and Recreation experience (people in destination, escape and refresh, and uniqueness and staff)	[88]
Senior tourism	Rejuvenation, Excitement, Novelty, and Local culture	[121]
Virtual tourism	Visual, Audition, Olfactory, Tactile, and Gustatory	[122]

5.3. RQ3: What Methods Are Used to Evaluate TX?

Kim et al. (2012) developed an MTX scale that was later used and/or adapted by many other scholars [43]. The scale includes 24 items grouped into 7 dimensions. The scale's internal consistency and validity were checked in a survey of American college students and later by Kim and Ritchie (2013) in Taiwan [123]. Kim (2014) developed a scale to measure the destination attributes associated with MTX in Taiwan [44].

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Anía Melón et al. (2021) used a scale that includes 48 items, 24 of which are from the MTX scale [124]. Chen et al. (2023) have used a scale with 24 items from the MTX scale, 16 items for 4 dimensions of rural TX (based on the Pine and Gilmore 4Es model), and 21 additional items [112]. Items were rated using a 7-point Likert scale in both studies. Several other studies are also based on the MTX scale but use 5-point Likert-type ratings. Coudounaris and Sthapit (2017) [125], Sthapit and Coudounaris (2017) [126], Zhong et al. (2017) [127], Gohary et al. (2018) [128], Zhang et al. (2018) [47], Sthapit et al. (2020), [129], and Lonc˘aric´ et al. (2021) [130] used the 24 MTX items and from 8 to 36 additional items and aimed to evaluate antecedents and consequences of MTX. Several studies have been based on adapted versions of the MTX scale. Chen et al. (2020) used only 3 dimensions (10 items) of the scale, adding 21 other items [94]. Rasoolimanesh et al. (2021) used 23 items of the MTX scale and 12 additional items [131]. Aydin and Omuris (2020) reexamined the MTX scale of Kim et al. in the Turkish context, using only 6 MTX dimensions with 20 items [132]. Items were rated based on either 7-point or 5-point Likert scales. Some authors argue that not all MTX dimensions were significant in the context of their studies. Some results indicate that only some of the 7 MTX dimensions seem relevant, at least in particular contexts where the studies have been performed. Coelho and Gosling (2018) argue that existing MTX scales, such as the one proposed by Kim et al. (2012) and Kim and Ritchie (2014), focus on the psychological characteristics of TX and lack a more holistic view [133]. They develop an MTX scale with 41 items grouped in 10 dimensions and validate it with Brazilian tourists.

Moon and Han (2018) have used a scale to evaluate TX quality based on the 4Es model of Pine and Gilmore [114]. Escobar et al. (2019) used a scale to examine the delightful TX [97]. Mendonça-Pedro et al. (2021) explored the role of the senses, emotions, and memories on MTX [134]. Buzova et al. (2021) point out the lack of instruments for evaluating the sensory stimuli perceived by tourists and propose an index to assess the sensory destination, the "destination sensescape" [135]. Chen et al. (2021) examined how TX touchpoints affect tourists' perceived well-being [136]. Su et al. (2022) studied how TX affects tourists' subjective well-being via recollection and storytelling [96]. Adam (2020) developed a scale to evaluate the negative tourist-to-tourist interactions [137]. Koç et al. (2022) have examined the relationship between negative tourist-to-tourist interaction, tourist emotions, and intention to recommend [77]. Ruiz et al. (2021) evaluated the effect of crowding on tourist satisfaction [104]. Wang et al. (2020) have explored the relationship between environmental stimuli and TX [138]. Huang and Choi (2019) have developed a scale to evaluate tourist engagement to capture the scope of the value co-creation process and its context-dependent nature [75]. Lin and Kuo (2016) have examined the behavioral consequences of TX in Taiwanese tourist townships [59]. Zatori et al. (2018) have developed a scale to evaluate how service providers can enhance TX in city sightseeing tours [99]. Ramires et al. (2018) studied the cultural city tourism motivations relating to specific destination attributes and their satisfaction [139]. Palos-Sanchez et al. (2021) have studied the factors influencing tourist intention to visit a city [140]. Chen et al. (2022) used a TX scale to explore the cultural tourism cities [100]. Tang et al. (2021) studied urban forest recreationists in China [110]. Bichler and Pikkemaat (2021) have explored skiers' motivation factors for visiting urban destinations with a winter sports infrastructure [141]. Suhartanto et al. (2020) developed a scale for agritourism TX [118]. Magno and Cassia (2021) studied the effect of business strategies to cope with the COVID-19 crisis in agrotourism [142]. Lee and Lee (2021) examined the emotional influences of rural travel on family cohesion [116]. Castellanos-Verdugo et al. (2016) studied the ecotourist experience in a natural park [143]. Moliner et al. (2019) examined the relationship between environmental sustainability, TX, and tourist satisfaction [95]. Lee and Han (2019) proposed a scale for low-carbon TX from the perspective of nature-based tourists [115]. Wang et al. (2012) studied the relationships between TX, service quality, tourist experiences, and revisit intention in wetland parks [144]. Xu et al. (2018) studied the relationships between TX, tourism involvement, and environmentally responsible behavior in a wetland park [145]. Cajiao et al.

(2022) used a scale to study the Antarctic TX [86]. Moliner-Tena et al. (2021) examined the relationship between MTX and destination sustainability at rural and sun and beach destinations [146]. Shen et al. (2021) studied the factors important to sailing tourists to ensure satisfying marina destination experiences [147]. Huang and Liu (2018) studied the creative experience and its impact on brand image and travel benefits when visiting famous temples [98]. Chang et al. (2020) developed a scale to evaluate pilgrimage experiences [70]. Suhartanto et al. (2021) used a scale to study the holistic experience of halal tourism and its consequences to tourist satisfaction and tourist intentions [88]. Chang and Hung (2021) developed a scale to evaluate TX for cultural and creative industry parks [107]. Orth et al. (2012) studied the role of brand-related attributions in the relationships between TX and their emotional attachments to place-based brands in international wine regions [148]. Luo et al. (2020) developed a scale to evaluate entertainment TX [101]. Olivier et al. (2022) developed a scale to evaluate TX in periodic hallmark festivals in Australia (PHFs) based on their PHF-TX model [120]. Aybek and Ozdemir (2022) studied the effects of ethnic restaurant experience [66]. Tan (2017) studied the impact of the use of smartphones on TX [80]. Lee and Jan (2022) proposed a scale to evaluate the smart TX in nature-based tourism [149]. Kullada and Kurniadjie (2020) examined the influence of digital information quality in TX [150]. Kim et al. (2021) studied the use of a mobility app and its impact on how mobility is perceived in TX [103]. Shaykh-Baygloo (2021) used a scale to study the TX of international travelers to a destination [105]. Rehman et al. (2023) studied the impact of TX on the perceived price reasonableness, regenerative tourism involvement, and the moderating effects of tourist destination loyalty and destination image [151]. Bezerra and Gomes (2019) studied passengers' loyalty to an airport in the multi-airport area [152]. Chen and Chou (2019) used a scale associated with their model of creative TX for "Generation Y" [102]. Sie et al. (2021) studied senior tourists' self-determined motivations, tour preferences, memorable experiences, and subjective well-being [121]. Tan (2017) studied the repeat visitation in the coastal town [153].

Some studies are based on multiple scales. Manthiou et al. (2022) combined three TX scales: emotional tourism experience, on-site tourism experience, and experience economy [154]. They present a composite TX scale with five dimensions: reverie, tourismscape, contemplation, transformation, and amusement. The study shows that the combined five-dimensional scale evaluates TX better than the three individual scales, but the proposed scale has yet to be described explicitly. Barnes et al. (2016) studied the impact of remem- bered TX in a safari park [155]. They used three questionnaires: at the entrance to the park, after visiting the park, and six weeks later. The study does not present the scale's items (spe- cific attractions of the safari park). When examining the family TX, Miyakawa and Oguchi (2022) used pre-travel and post-travel scales [79]. Both scales included items to evaluate five well-being domains. MTX was assessed on the post-travel scale. Children's generic skills were evaluated based on their parents' ratings on both pre- and post-travel scales. Children's responses were evaluated on pre- and post-travel scales, based on the same generic skills used to capture their parents' perception. Each item was adapted by translat- ing it into wording that children could understand; children rated items based on emoji scales and accompanied by word labels ranging from strongly disagree to strongly agree.

TX scales are detailed in Appendix A, Table A1. Most of the studies were performed in China and Taiwan (over 16% each), Spain (over 10%), and the USA (almost 6%).

Many studies are based on interviews. Pomfret (2012) examined TX in adventure activities during packaged mountaineering holidays [156]. Tan et al. (2014) studied creative tourists, active co-creators of their experiences [157]. Knobloch et al. (2016) studied the nature of individual experiences regarding personal outcomes, emotions, and meanings [158]. Anaya and Lehto (2023) studied memorable tourism moments (MTMs) [49]. Unger et al. (2016) studied the business travel experience [67]. Gao and Kerstetter (2018) studied the emotion regulation strategies tourists use during vacations [159]. Wassler and Kirillova (2019) examined the host–guest relationship in tourism as "Gazers" and "Gazees" [160]. Zhang et al. 2021 studied how the COVID-19 pandemic changed social interaction [161].

Kastenholz et al. (2012) studied rural TX in a historical village [162]. Kirillova et al. (2014) studied the dimensions of tourist aesthetic judgment for nature-based and urban tourist destinations [106]. Choi and Wong (2018) studied the negative impact of confusing toponymy and place name conversion on foreign tourists' experiences [163]. Ebejer et al. (2019) examined urban heritage spaces in TX [164]. Seyfi et al. (2019) analyzed the factors that influence TX in cultural tourism [165]. Sanz-Blas et al. (2019) studied the relationships between destination image/familiarity, satisfaction, and behavioral intention for cruise tourists [166]. Olson and Reddy-Best (2019) studied TX for transgender and gender nonconforming individuals [84]. Sedgley et al. (2017) explored the experiences of mothers of children with autism spectrum disorder (ASD) during holidays [83]. Rubio–Escuderos et al. (2021) analyzed the TX of people with reduced mobility [167]. Van der Zee et al. (2017) studied the governance of tourism networks based on in-depth interviews with network managers [92].

Humagain and Singleton (2021) used semi-structured online focus group discussions to identify tourists' motivations, constraints, and negotiation strategies to participate in outdoor recreation trips during the COVID-19 outbreak [168]. Their study was re-printed 2 years later [169]. It is the only study based on a focus group.

Several netnography studies are based on data collected from TripAdvisor. Sthapit (2017) explored the MTX in hotels from Finland [170]. Thanh and Kirova (2018) studied the wine TX in Cognac, France [171]. Liu et al. (2019) analyzed the reviews made by foreign tourists that visited Beijing, China [172]. Oliveira et al. (2019) think more research on TX should be conducted based on online reviews, and they analyzed opinions on two islands of Cape Verde [173]. Yu et al. (2021) studied the city TX of London's top ten most popular tourist attractions [174]. Bigne et al. (2020) analyzed opinions on Spanish national parks and compared MTX vs. OTX dimensions [48]. Tokarchuk et al. (2022) analyzed the tourism carrying capacity in Berlin [175]. Yigit (2022) studied foreign tourists' cooking class experiences in Istanbul [176].

Bosangit (2015) indicated that travel blogs can offer insights into how tourists express the transformational effects of their experiences for the self [177]. Their study is based on the travel blogs of British bloggers. Anaya and Lehto (2020) examined the impact of technologies on TX, based on travel blogs from the last decades extracted from Travelblog.org [178]. Kim et al. (2020) studied the causes of negative TX based on Chinese travelogues available on Mafengwo [179]. Lin et al. (2022) studied TX in a National Wetland Park in China based on traveler reviews extracted from three popular Chinese online tourism communities [111].

Yang et al. (2021) focused on geo-tagged check-in user-generated content data, evaluating tourists' emotional experience as expressed on Chinese check-in pages on social media, through semantic analysis [180]. Liu et al. (2023) studied stranded travelers during the COVID-19 pandemic outbreak, focusing on post-traumatic growth [181]. They analyzed several resources: (1) chat records from seven WeChat mutual assistance groups of stranded travelers from Hubei Province, China,;(2) text data published by stranded travelers on online platforms; (3) information related to the stranded travelers reported by three Chinese news websites; and (4) official information released by the Chinese government.

Strijbosch et al. (2021) used electrophysiological measures and experience reconstruction in a musical theater show in the Netherlands [182]. They recorded physiological data with wearable wristbands (during-experience). Mitas et al. (2020) studied the relationship between emotional arousal and intent to recommend of visitors to Vincentre Museum and guided village tour in Nuenen, the Netherlands [183]. They measured emotional arousal as skin conductance responses. Bastiaansen et al. (2020) used psychophysiological measurements during a roller-coaster ride in Europapark, Germany [184].

Adongo et al. (2017) examined the relationship between TX and the intended length of stay in Ghana [185]. They used a self-reporting approach based on a survey with open-ended questions instead of scales. Coelho et al. (2018) focused on the core processes of MTX in an exploratory and qualitative approach based on the travel narratives of Brazilian

tourists [50]. When studying the transformative learning nature of Malaysian homestay experiences, Inversini et al. (2022) asked participants the self-record short videos answering a single broad open question: 'What have you learned or gained from this homestay experience?' [69]. Sørensen and Jensen (2016) conducted a field experiment in a retro-design boutique hotel in Copenhagen, in which service encounters were developed into experience encounters [186]. Moscardo (2020) explored the use of stories in designing dimensions of tourism and tourist experience [187].

Some studies were based on mixed TX evaluation methods. Servidio and Ruffolo (2016) focused their study on the relationship between MTX, emotions, and narratives, using a mixed quantitative and qualitative approach [46]. Participants were asked to identify the occurrence and describe six basic emotions at four stages of their travel: anticipation, travel to, on-site, and travel back. Sugathan and Ranjan (2019) performed three independent vignette-based experiments to manipulate levels of experience and co-creation [39]. Fang et al. (2023) examined the impact of word-of-mouth communication on TX storytellers, comparing oral and written communication [188]. Gardiner and Scott (2018) explored the development of new tourism experiences (TXs) on the Gold Coast, Australia [189]. They used a scale to assess the likelihood of tourists' participation in new TXs. Quantitative data were used for the planning of four focus group sessions. In their study of tourist segmentation in coastal tourism in West Ireland, Pafi et al. (2020) used semi-structured interviews in the first stage of their work [87]. In the second stage, they used a 16-item scale; the questionnaire also included an open-ended question. Gardiner et al. (2023) explore the role of self-identity in motivating participation in adventure tourism, comparing the views of youth from 4 countries (Australia, China, Singapore, and Germany) towards a learn-to-surf lesson [190]. Firstly, they conducted an in-depth mystery shopper research. In the second phase, an online survey was conducted. Dickinson et al. (2016) studied the TX of mobile disconnection in UK [191]. They used in-depth exploratory interviews and a 6-item scale. Moyle et al. (2017) assessed the preferences of potential visitors for nature- based experiences in protected areas in Australia through semi-structured interviews with stakeholders, and an online survey [192]. Gardiner et al. (2022) explored the staged authenticity in historical heritage tourism experiences in Australia, focusing on TX that has little relevance to where it was built [108]. Their study included semi-structured interviews, and a 22-item scale. In their study on tourism as an (integrative) service, Mendes et al. (2022) used focus groups in the first stage of their study, then a survey based on a scale in Portugal [40]. Komppula et al. (2016) examined TX in social holidays in Finland based on observations, semi-structured interviews, and questionnaires with open-ended questions [119]. When studying the engagement in diaspora tourism in mainland China, Weaver et al. (2017) used several qualitative methods: participant observation, casual discourse, auto-ethnography, and blog posts [76]. Gundersen and Rybråten (2022) analyzed how tourists, residents, and local stakeholders experience and practice their participation in the landscapes, based on focus groups, semi-structured interviews, an on-site survey, and internet surveys [193].

Hosseini et al. (2021) indicated that most of the studies on MTX are based on quantitative methods (52%); 36% of the studies are based on qualitative methods, and 12% are using mixed quantitative/qualitative approach [45]. In their review of MTX, Hosany et al. (2022) highlighted that studies usually employ quantitative methods and generally neglect negative experiences in TX [194]. Godovykh and Tasci (2020) indicated that most scholars do not evaluate TX as a whole; they focused on the cognitive and conative experience components based on self-reported pleasure from past experiences [38]. They highlighted several limitations of self-reported scales. They recommend evaluating TX moment-by-moment as it occurs, combining methods such as self-report scales, experience sampling, laboratory experiments, and psychophysiological techniques; various methods could maximize the TX insights. Ingram et al. (2017) acknowledged the need for improved TX evaluation methods and approaches [195]. They proposed the PART (prospective, active and reflective triangulation) as a "novel methodology for acquiring data before, during,

and after the holiday". Amaral et al. (2020) proposed a model for the design and evaluation of TX in seniors called OEC (organic, experiential, complex) [196].

Table 7 synthesizes the TX evaluation methods used in the studies we reviewed.

Table 7. TX evaluation methods.

Method	Studies
Scale	[43,44,47,59,66,70,71,75,77,79,80,86,88,94–105,107,110,112,114–116,118,120,121,123–155]
Interview	[49,67,83,84,92,106,156–167]
Focus Group	[168,169]
Netnography	[48,111,170–181]
Physiological Measures	[182–184]
Other methods	[50,69,185–187]
Mixed methods	[39,40,46,76,87,108,119,188–193]

Most of the TX studies were based on scales (54.9%), followed by interviews (14.8%) and netnography (11.5%). The most-used scale was that of MTX proposed by Kim et al. The scale was validated in cross-cultural contexts and was used by several authors in its initial adapted forms. Scales were included for a wide range of dimensions and items. Items were most frequently rated based on 5-point or 7-point Likert scale, but more detailed scales with up to 11 points were sometimes used. Remarkably, new scales were proposed instead of using scales proposed by other others. Scales need more validation in cross- cultural contexts. When evaluating TX in specific areas, generic scales may miss particular dimensions. Most of the studies focused on TX antecedents and consequences but not on TX evaluations. This may need to be clarified for TX practitioners.

Surveys based on scales are inexpensive and can identify TX weaknesses but not their causes. Scales should be complemented with other methods. There is a declared need for holistic TX evaluation, but few studies use mixed methods. Interviews are expensive, but netnography is relatively cheap. Most of the studies based on netnography use opinions collected from TripAdvisor.

Two TX evaluation methodologies (evaluation models) have been proposed; they are rather general. TX is constructed through several touchpoints, and holistic TX evaluations should focus on all (or at least the most relevant) touchpoints, dimensions, and context. If we consider TX to be an extension of UX focused on using tourism-related products, systems, and services, then UX evaluation methods may also offer valuable outcomes.

5.4. RQ4: How Is the Post-Pandemic TX?

Humagain and Singleton (2021) acknowledge that the COVID-19 outbreak has influenced tourists' psychology, behavior, and decision-making when participating in outdoor activities. They identify the lack of centralized and reliable information as a significant constraint when planning those activities [168]. Yang et al. (2021) indicate that tourists' (real-time on-site) emotional experience after the outbreak of COVID-19 was significantly lower than that pre-pandemic [180]. In their view, managers should focus on the post-pandemic TX. Kim et al. (2021) emphasize that mobility was stressful, and tourists' health was threatened during the COVID-19 pandemic [103]. Zhang et al. (2021) examine how the COVID-19 pandemic has changed social interaction in international tourism, and it could likely impact tourists' social identity and future behaviors [161].

Zhu et al. (2022) have examined the impact of theme park images on tourist-perceived value and behavioral intention during the COVID-19 pandemic [197]. Humagain and Singleton (2023) have studied tourists' motivations, constraints, and negotiations regarding outdoor recreation trips during the COVID-19 outbreak [169]. They indicate that COVID- 19-related restrictions and fewer outdoor opportunities encouraged outdoor recreation, novelty-seeking, and experiencing normalcy. Buckley et al. (2022) argue that mental health research should be used in tourism [198].

Björk et al. (2020) highlight that in COVID-19 post-pandemic, "it is essential to examine how and to what extent the crisis changes peoples' fundamental values, motives, and tourist behaviors, how it boosts the short-distance/domestic market and virtual tourism experiences, and whether it may eventually benefit climate change adaptation and mitigation or provide solutions for over-tourism" [65]. They also indicate the need for research on sustainable and digital TX. Ioannides and Gyimóthy (2020) point out that the COVID-19 pandemic offers the opportunity to design and consolidate the transition towards greener and more balanced tourism [199]. Bosone and Nocca (2022)identify a growing awareness of sustainability and point out that this has been influenced by the health emergency of the COVID-19 pandemic [200]. Tokarchuk et al. (2022) highlight that, in the post-COVID-19 era, a negative TX due to overcrowding is a significant concern for destination managers [175]. Fusté-Forné (2023) has identified that slow tourism has been revalorized because of the COVID-19 pandemic [201]. Liu et al. (2023) reveal ten sources of trauma caused by the COVID-19 pandemic and faced by stranded travelers and identified five dimensions of post-traumatic tourism growth: meaning-seeking, reconstructing a life philosophy, identity, prosocial behavior, and awe of nature [181].

Altinay and Kozak (2021) acknowledge the possible shifts in tourist behavior and post-pandemic destination competitiveness [202]. They intend to "capture the edge of chaos of the tourism industry, the butterfly effects of COVID-19, cosmology, bifurcation events and behaviors, and health and safety-driven self-organization for destination competitiveness" through what they call "the butterfly competitiveness model". Magno and Cassia (2021) remark that the effects of tourism businesses' strategies to mitigate the COVID-19 crisis remain scarce [142]. They propose a model for the relationships between strategy and performance which includes five dimensions of corporate social responsibility behaviors.

Stankov and Gretzel (2020) highlight the importance of technologies in tourism, especially during the COVID-19 pandemic when virtual tourism was the only option [203]. They argue for the importance of using a human-centered design (HCD) approach in Tourism 4.0 technologies. Verma et al. (2022) recognize that virtual tourism emerged as an alternative to physical tourism due to the COVID-19 pandemic as a preview of the actual destinations and attractions [74]. Pasquinelli et al. (2023) study the online TX based on Airbnb Online Experience (AOE) reviews during the COVID-19 pandemic [204]. Their study highlights the role of the human dimension and human-to-human interaction, despite the digital mediation of the in-remote destination visit.

The COVID-19 pandemic was not only health-threatening but has undoubtedly influenced tourists' psychology, behavior, and decision-making. Emotional experience was remarkably different compared to the pre-pandemic era. Mobility was particularly stressful, social interaction was avoided, and tourists preferred outdoor recreation. There is an increasing awareness of the need for transitioning to greener, sustainable, more balanced, "slow" tourism and for corporate social responsibility behavior. Post-pandemic overcrowding was detected as a significant concern for destination managers.

As virtual tourism was at one point the only option, it became evident that technologies can and should play an increasing role in the post-pandemic era. Virtual tourism should not replace but should rather empower physical tourism. Human-centered design (HCD)'s fundamental approach in HCI and U was also highlighted as a must in TX design and management.

6. Conclusions

Tourism was dramatically affected by the COVID-19 pandemic, but it is now recovering. However, post-pandemic tourism should deal with new challenges. Overcrowding was detected as a significant concern for destination managers. Several authors have pointed out the increasing awareness of the need for transitioning to greener, sustainable, more balanced, "slow" tourism, as well as for corporate social responsibility behavior. Virtual tourism, the only option during the pandemic, will not replace but rather empower physical tourism, and technologies may help improve TX. Even if COVID-19 is no longer a

global emergency, lessons learned during the pandemic may be helpful when dealing with future challenges and crises. Human-centered design, a fundamental approach in HCI and UX, was also highlighted as necessary in TX design and management.

TX has been discussed in many studies. However, there still needs to be more consensus on its definition, dimensions, and evaluation methods. In our view, TX is a particular type of CX in which tourists are a specific case of customers interacting with tourism "brands" (organizations, companies). We consider CX and TX as extensions of UX. From a UX point of view, a tourist is a user of specific, tourism-related products, systems, or services. Based on the Godovykh and Tasci definition, we consider TX to be the cognitive, affective, sensory, and conative subjective perceptions, either negative or positive, and affected by situational factors, that a tourist has when interacting with brands, pre-, during, and post-travel, including their outcomes.

As several scholars indicate, TX is generated through a process that includes three stages (pre-, during, and post-travel), and the whole process should be analyzed. Most studies focus on MTX, but research should also address negative and ordinary TX. Many authors agree that TX is more than service quality and satisfaction, and a holistic, human-centered approach to TX is necessary. In order to properly understand and manage TX, its dimensions should be clearly identified. Most of the studies are based either on the seven-dimensional TX model of Kim et al. or on the experiential economy four-dimensional model of Pine and Gilmore (4Es). Godovykh and Tasci correctly identify four main TX dimensions: affective, cognitive, conative, and sensorial.

TX is usually evaluated in a quantitative approach, mainly based on scales. The MTX scale proposed by Kim et al. is used in its original or adapted form in many studies. TX scales include a wide range of dimensions and items. Items are usually rated on 5-point or 7-point Likert scales, but up to 11-point scales are sometimes used. Studies focus on examining the relationship between TX dimensions, its antecedents, and consequences rather than on TX evaluation results. Several scholars emphasize the importance of qualitative research in TX and the need for holistic TX evaluation, but only some studies use mixed methods. The need for standardized evaluation instruments may be problematic for TX practitioners. A holistic approach to TX should identify all touchpoints that occur in pre-, during, and post-travel stages; TX evaluation should explicitly focus on touchpoints, dimensions, and context of interest.

The main limitation of our study is that we have focused on only two scientific databases: Web of Science (WOS) and Science Direct (SD). We decided to do so in order to keep the information manageable. However, we think that this should not be a major concern, as most of the studies indexed in WOS and SD were published in high quality journals. We consider that the 167 articles that we fully analyzed cover the topics of our research well.

Only two TX evaluation models have been proposed, but they are rather general. The need for standardized, cross-culturally validated evaluation tools with both generic and specific evaluation models presents gaps that are still to be filled. If we consider TX an extension of UX, then UX evaluation methods offer valuable outcomes. Over the years, we developed several heuristics and evaluation models for UX tourism-related digital products. We also developed heuristics to evaluate CX in retail. In future work, we will particularly focus on developing TX heuristics and checklists.

Our research contributes to better understanding the rather heterogenous approaches to TX. We propose a holistic TX definition that considers TX as a UX extension and a particular case of CX. Our study identifies the trends in TX research over the last decade. It also highlights several gaps: (1) the relative lack of qualitative and mixed TX research, (2) the neglect of ordinary and negative TX, and (3) the scarcity of TX (evaluation) models. Our study has both theoretical and practical contributions. It certainly helps researchers to identify relevant TX definitions, dimensions, and models, and the research gaps to be addressed in the future. It may also help TX managers to select appropriate TX design and evaluation tools, both general and specific.

Our study highlights several future research directions. First, there is still a need for TX definitions. The holistic definition that we propose can certainly be improved. Second, comprehensive TX models are still necessary. General and specific TX dimensions and subdimensions (factors, attributes) must be clearly identified, as they are establishing the ground for both TX evaluation and design. Third, TX evaluation models (methodologies) are yet to be established. They should allow for the evaluation of specific TX aspects as well as holistic TX evaluations.

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Appendix A

Table A1. TX scales.

Study	Area	Context	Dimensions	Items and Rating
[43,123]	MTX	USA, Taiwan	Hedonism, Refreshment, Local culture, Meaningfulness, Knowledge, Involvement, Novelty	24 items, 7-point Likert scale
[44]	MTX	Taiwan	Local culture, Variety of activities, Hospitality, Infrastructure, Environment management, Accessibility, Quality of service, Physiography, Place attachment, Superstructure	33 items, 7-point Likert scale
[124]	Hotels	Spain	7 dimensions from Kim et al. 2012, Destination image, Tourist engagement, Satisfaction, Revisit intention, Recommendation intention	48 items, 7-point Likert scale
[112]	Rural TX	China	7 dimensions from Kim et al. 2012, Education, Esthetic, Entertainment, Escapism, Connectedness to nature, Environmental awareness, Green consumption	61 items, 7-point Likert scale
[125]	Zoo and museum	Finland	4 dimensions from Kim et al. 2012	30 items, 5-point Likert scale
[126]	Destination	Finland	7 dimensions from Kim et al. 2012	30 items, 5-point Likert scale
[127]	MTX	USA	7 dimensions from Kim et al. 2012	42 items, 5-point frequency scale

Table A1. *Cont.*

Study	Area	Context	Dimensions	Items and Rating
[128]	Eco-tourism	Iran	7 dimensions from Kim et al. 2012	33 items, 5-point Likert scale
[47]	MTX	China	7 dimensions from Kim et al. 2012	60 items, 5-point Likert scale
[129]	Sardinia	Italy	4 dimensions from Kim et al. 2012	39 items, 5-point Likert scale
[130]	Natural Attractions	Croatia	3 dimensions from Kim et al. 2012	39 items, 5-point Likert scale
[94]	MTX	China	3 dimensions from Kim et al. 2012	31 items, 7-point Likert scale
[131]	Destination	Iran	3 dimensions from Kim et al. 2012	35 items, 5-point Likert scale
[132]	MTX	Turkey	6 dimensions from Kim et al. 2012	20-items, 5-point Likert scale
[133]	MTX	Brazil	Environment, Culture, Relationship with companions, Relationship with tourists, Relationship with local agents, Dream, Emotion, Novelty, Refreshment, Meaningfulness	41 items, 7-point Likert scale
[114]	Island	South Korea	Escapism, Relaxation, Enjoyment, Involvement, Perceived value, Perceived price reasonableness, Satisfaction with tour experience, Loyalty to an island, Island image	30 items, 7-point Likert scale
[97]	City	Spain	Cognitive, Affective, Delight	35 items, 5-point Likert scale
[134]	MTX	Portugal	Senses, Emotions, and Memories	47 items, 7-point Likert scale
[135]	Sensory stimuli	Spain	Visualscape, Smellscape, Tastescape, Soundscape, Hapticscape	17 items, 7-point Likert scale
[136]	TX Touchpoints	China	4 types of Touchpoints (destination-owned, partner-owned, tourist-owned, and social) and 2 categories of Well-being (hedonic and eudaimonic)	32 items
[96]	Well-being	China	Sensory, Feelings, Knowledge, Behavior, authenticity, Co-creation, Novelty, Recollection, Storytelling, Well-being	39 items, 7-point Likert scale
[137]	Negative tourist-to-tourist interaction	Ghana	Interpersonal directed negative interaction, Interpersonal non-directed negative interaction, Site-directed negative interaction, Intrapersonal negative interaction, Value, Memorability	26 items, 5-point Likert scale
[77]	Negative tourist-to-tourist interaction	Turkey	Interpersonal directed negative interactions, Interpersonal non-directed negative interactions, Site-directed negative interactions, and Intrapersonal negative interactions	51 items, 7-point Likert scale
[104]	Island	Spain	Social stimulation, Privacy level, Behavioral constraints, Perceived control, Social setting characteristics, Physical setting characteristics, Personal characteristics	34 items, 9-point scale
[138]	Cruise	China		
[75]	Cruise	USA	Environmental stimuli and TX	16 items, 5-point Likert scale
			Social interaction, Interaction with employees, Relatedness,	16 items, 5-point Likert scale
[59]	City	Taiwan	Activity-related tourist engagement Experiential stimuli, Flow, Positive emotion, Perceived value, Satisfaction, Intention to recommend, Intention to revisit	24 items, 7-point Likert scale

Table A1. *Cont.*

Study	Area	Context	Dimensions	Items and Rating
[99]	City	Hungary	Interaction, Interactive experience environment, Organizational experience environment, Customization, Experience involvement, Experience authenticity, Memorability	43 items, 7-point Likert scale
[139]	Cultural	Portugal	City attributes	18 items, 5-point Likert scale
[140]	City	Spain	Information, Entertainment, Self-Expression, Satisfaction, Intention to visit a City, Mobile Convenience, TX	27 items
[100]	Cultural	China	Sensory experience, Action experience, Emotional experience, Thinking experience	15 items, 7-point Likert scale
[110]	Urban forest	China	Destination image, Recreational benefits, Satisfaction, Perceived value, Behavioral intentions	40 items, 5-point Likert scale
[141]	Urban wintersport	Austria	Push factors, Pull factors, Satisfaction, Cultural satisfaction, Winter sports, Intention to revisit	42-items, 5-point Likert scale
[118]	Agrotourism	Indonesia	Uniqueness, Learning, Staff, Escape, Peace-of-mind	31 items, 5-point Likert scale
[142]	Agrotourism	Italy	Community, Employees, Environment, Heritage, Products, Proactive strategies, Reactive strategies, Co-creation experience, Performance	32 items, 5-point Likert scale
[116]	Rural	South Korea	Destination quality, Family cohesion, Refreshment, Novelty, Arousal, Meaningfulness, Involvement	31 items, 7-point Likert scale
[143]	Ecotourism	Dominican Republic	Ecotourism knowledge, Attitudes towards ecotourism, Perceived value of ecotourist site, Ecotourist satisfaction, Behavioral intentions	32 items, 5-point Likert scale
[95]	Environmental sustainability	Spain	Cognitive, Affective, Behavioral, Sensorial, Social, Environmental sustainability, Tourist satisfaction	36 items, 5-point Likert scale
[115]	Low-carbon tourism	Taiwan	Sensory, Affective, Learning, Sociocultural, Behavioral, Escapism, Prestige	40 items, 7-point Likert scale
[144]	Wetland parks	China	Post-trip Behavioral Intention, Action Experience, Aesthetic Experience,	Emotional Experience, Resource Conditions, Recreational Activities, Tourism Facilities, Integrated Management, Related Personnel Importance and pleasure, Sign value, Risk probability and consequence,
[145]	Wetland parks	China	[86] Antartic Antartic	

Resource and environment experience, Facility management experience, Environmentally responsible behavior Perceived learning, Measured learning, Satisfaction, Environmental concerns, Management preferences, Behavior intentions	43 items, 5-point Likert scale
	23 items, 5-point Likert scale
	38 items, 11-point Likert scale, True/False Quiz

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Table A1. *Cont.*

Study	Area	Context	Dimensions	Items and Rating
[153]	Coastal	Taiwan	Destination image, Constraint, Escapism, Entertainment, Esthetics, Education	45 items, 5-point Likert scale
[146]	Rural and coastal	Spain	MTX, Destination sustainability	19 items, 5-point Likert scale
[147]	Coastal	Denmark, UK	Satisfying marina destination experiences	28 items, 5-option scale
[98]	Religious	Taiwan	Relaxation benefit, Health benefit, Brand image, Culture learning, Peace of mind, Escape, Unique involvement, Interactive opportunities	29 items, 7-point Likert scale
[70]	Religious	Taiwan	Spirituality, Learning, Physicality, Help, Unpleasantness	19 items, 7-point Likert scale
[88]	Halal	Indonesia	Holistic experience, Religiosity, Satisfaction, Intention to revisit, Intention to endorse	41 items, 5-point Likert scale
[107]	Industries parks	Taiwan	Learning, Recreation, Exhibitions, Service, Food, Facilities, and Souvenirs	27 items, 7-point Likert scale
[148]	Wine regions	Several Countries	Emotional attachments to place-based brands	7-point Likert, semantic differential, and metric scale
[101]	Entertainment	Macau	Learning, Enjoyment, Escape, Refreshment, Novelty, Involvement, Local culture	26 items, 7-Likert scale
[120]	Hallmark festivals	Australia	Emotional value, Functional value, Monetary value, Social approval value, Self-image congruency value, Safety value, Tourist Intentions, Wellbeing, Festival Attachment	29 items, 7-point Likert scale
[66]	Restaurant	Turkey	Food, Service, Atmosphere, Authenticity, Destination food image	29 items, 5-point Likert scale
[80]	Smartphone and TX	Taiwan	Travel motivation, TX, Satisfaction, Sharing motivation, Smartphone usage, Pastime	56-items, 5-point Likert scale
[149]	Nature-based	Taiwan	Aesthetics, VR/AR presence, Usefulness, Ease of use, Hedonic experience, Trust, Learning experience, Satisfaction, Loyalty	30-items, 7-point Likert scale
[150]	Digital information quality	Thailand	Destination image, Perception of destination attributes, Satisfaction, Behavioral intention	34-items, 5-point Likert scale
			Usefulness, Trust, Interactivity, Behavioral control over mobility,	

[103]	Mobility app	South Korea	Stress from mobility, MTX through mobility app, Mobility app reuse intention	32-items, 7-point Likert scale
[105]	International travelers	Iran	Place identity, Place attachment, Place dependence, Perceived quality of and value of attractions, Satisfaction	23-items, 5-point Likert scale
[151]	Regenerative tourism	Saudi Arabia	Escapism, Relaxation, Enjoyment, Involvement, Perceived price reasonableness, Regenerative tourism involvement, Destination loyalty, Destination image, Satisfaction	38 items, 7-point scale

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Table A1. *Cont.*

Study	Area	Context	Dimensions	Items and Rating
[71]	Destination loyalty	China	Pre-trip involvement, Satisfaction with co-creation, Place attachment, Destination loyalty	17-items, 7-point Likert scale
[152]	Airport loyalty	Brazil	Expectation, Perceived value, Passenger satisfaction, Image, Complaints, Switching costs, Loyalty, Check-in, Security, Convenience, Ambiance, Basic facilities, Mobility	59-items, 7-point Likert scale
[102]	Creative TX	Taiwan	Uniqueness, Identification, Attractiveness, Perceived coolness, Satisfaction, Place attachment, Destination loyalty	34-items, 5-point Likert scale
[121]	Seniors	Australia	Self-determined motivations, Tour preferences, Memorable experiences, Feelings, Perceived benefits, Life satisfaction	78 items, 7-point and 5-point Likert scales
[154]	TX	USA	Reverie, Tourismscape, Contemplation, Transformation, Amusement	56 items, 7-point Likert scale
[155]	Safari Park	Denmark	Experiential expectations	3 questionnaires, 7-point Likert scale
[79]	Family	Japan	Positive emotion, Engagement, Relationship, Meaning, Accomplishment	11-point scale, 5-point scale, 5-emoji scale for children

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