

# Emotions and Student eXperience: A Literature Review

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**Abstract.** Student eXperience (SX) covers a broad range of aspects, including the emotional one. The importance of emotions is more evident when we analyze SX as a particular case of Customer eXperience (CX), which considers the emotional customer-brand relationship. For this reason, it is important to analyze the role that emotional aspects have in SX. This article presents a literature review of the last 5 years (between 2015 and 2021) regarding the impact of emotions on SX. The results show that there is a lack of studies that address the topic from a CX perspective. Articles analyze mainly three aspects: students' well-being, their learning experiences, and their engagement.

**Keywords:** Student eXperience, Customer eXperience, Emotions, Literature Review.

## 1 Introduction

The satisfaction and well-being of students are conditioned by the quality of interactions with their respective Higher Education Institutions (HEI). These interactions are studied in a wide variety of topics (Hong et al. 2020) [1], which are influenced by multiple factors. This leads us to the concept of Student eXperience (SX). Since the SX can be conceived as a particular case of Customer eXperience (CX) within the student environment, the analysis of these experiences can be carried out from a CX perspective.

According to Hill et al. 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” [2]. Other authors, such as Klaus & Maklan, specifically focuses their definition on affective aspect [3].

Although the concept of CX may differ from definition to definition, the importance of the emotional and affective aspects of interactions are a common ground. It is therefore interesting to collect information and analyze the role and implications of emotions in SX. Emotions are highly relevant in Human Computer-Interaction (HCI). In recent years HCI scholars show an increasing interest in CX.

We carried out a literature review in order to analyze the role and impact of emotions on SX. We want to better understand the emotions nature of SX, in order to improve its evaluation, and to hopefully enhance students' satisfaction. We used 5 scientific databases: Scopus, Science Direct, Web of Science, ACM Digital Library, and IEEE Xplore. In this review we searched for articles published between 2015 and 2021, following as guide the framework proposed by Kitchenham, initially designed to carry out literature reviews in software engineering [4].

## **2 Background**

### **2.1 Customer eXperience**

The understanding of CX concept is of vital importance to satisfy the needs and engage the clients of a company. Klaus & Maklan define CX as “the customer’s cognitive and affective assessment of all direct and indirect encounters with the firm relating to their purchasing behavior” [3]. Other authors, such as Lemon & 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” [5]. Customer journey includes the “collections of touchpoints between users and organizations” where touchpoints are the combination of channel, device, and user task [6]. Understanding the nature of these interactions may be related to the HCI area as they may be subject to the use of a computerized products, systems or services.

All CX definitions refer in some way to emotions and/or affective aspects. Since the customer-company interactions can be both physical and emotional [2], it is interesting to analyze how emotions manifests, and how they impact the customers, in our case the students. In this article we focus on analyze the role that emotions have in SX, and the way in which they affect it.

### **2.2 Student eXperience**

Student eXperience is a subject widely covered in the literature. A large number of topics related to students' experiences have been detected. Hong et al. have identified through text mining the research trends related to SX. Twenty-one topics referring to the SX were identified, where the affective and emotional aspects are related to the “First-year transitions” and “Assessment and feedback” topics respectively [1].

One of the perspectives for analyzing the interactions and perceptions of students is that of CX. In this way, the SX is a particular case of CX where the customer-brand relationship is specified in a student-HEI interaction. In this way, SX can be defined from a CX approach as all the perceptions that a student experiences when interacting,

both physically and emotionally, with the products, systems or services offered by a HEI. SX includes the whole student's journey, from the "pre-consumption" stage to the "post-consumption" stage and contemplating external and internal spaces to the HEI.

Our study looks for the role that emotions have in student-HEI interactions, and what is the emotions' impact on SX.

### **2.3 Emotions**

Although there's no general agreed definition for "emotions" in 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" [7] [8].

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 [9]. 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 [1], assessing students' emotions may be complex. This difficulty is also influenced by the need for multidimensional evaluation models [10].

## **3 Research Method**

This literature review was performed with the guide of a framework for performing literature review in software engineering, proposed by Kitchenham [4], which includes the following 3 phases: i) Planning the review, which involve the definition of the research questions, ii) Conducting the review, which involves the development of the search strategies and data extraction criteria, and iii) Reporting the review, which involve the presentation and discussion of the results of the review.

To ensure the rigor of the literature review, the checklist of elements proposed by the PRISMA methodology was used, focused on improving the content of a literature review and meta-analysis [11].

### 3.1 Research Question

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 1 presents the research questions (RQs) that guided the study.

**Table 1.** Research questions utilized in the literature review.

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?

### 3.2 Search Strategy

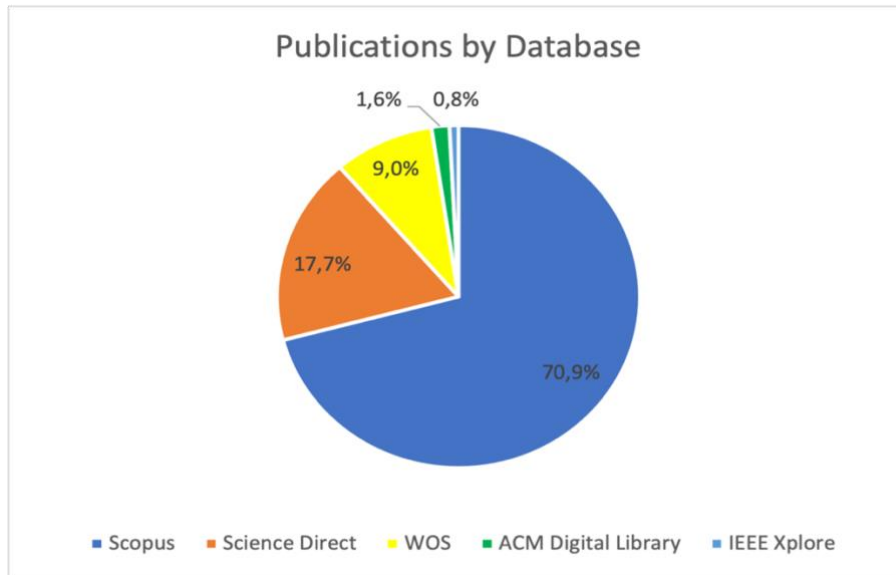
For this research we examined the literature published within the last 5 years (from 2015 to 2021), indexed in five databases: Scopus, Science Direct, Web of Science, ACM Digital Library, and IEEE Xplore. The search strings were formulated based on the relevant topics to the literature review. In all 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 2.

**Table 2.** Search results in databases using the search strings.

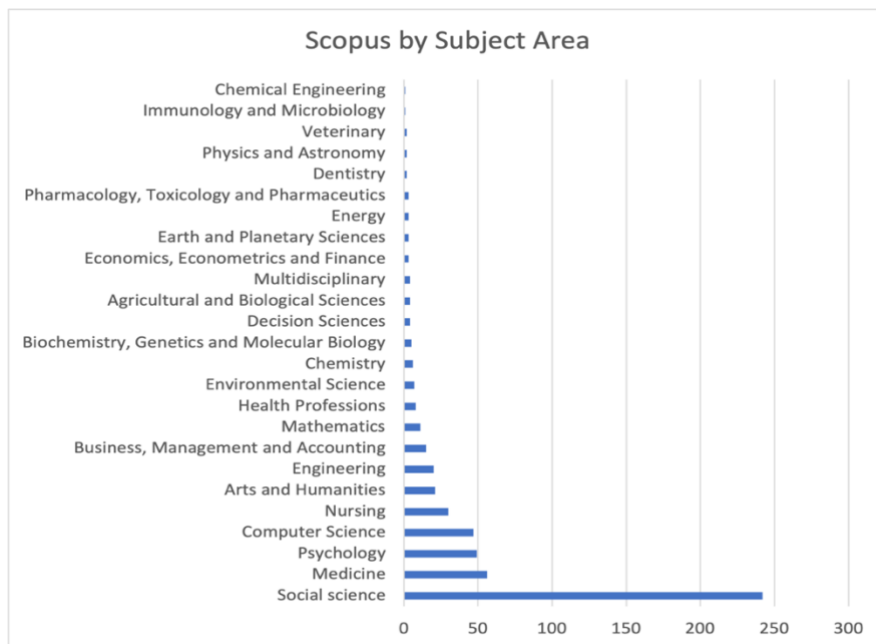
Database	Number of articles	% of articles
Scopus	356	70.9%
Science Direct	89	17.7%
Web of Science	45	9.0%
ACM DL	8	1.6%
IEEE Xplore	4	0.8%

Fig. 1 presents the percentage of studies indexed in each database. Scopus offers by far the largest number of studies (70.9%), while IEEE Xplore offers the fewest (0.8%). Since Scopus indexes studies referring to various areas, it is understandable that a large number of documents appear in this database. It is interesting to note that both ACM Digital Library and IEEE Xplore feature a small percentage of documents. This is due to the subject area that these databases handle, referring to electronics, computer science and engineering. This shows a low interest on the impact of emotions on the SX within these areas.

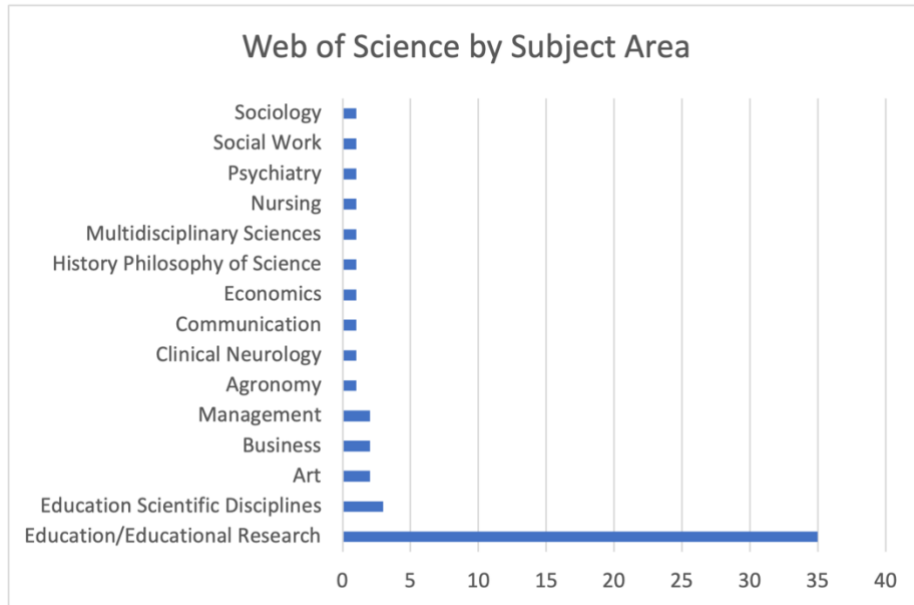
Fig. 2 indicates the area of knowledge associated to the 356 documents indexed in Scopus database. By far, most studies are associated to Social Sciences (242).



**Fig. 1.** Articles percentage by scientific databases.

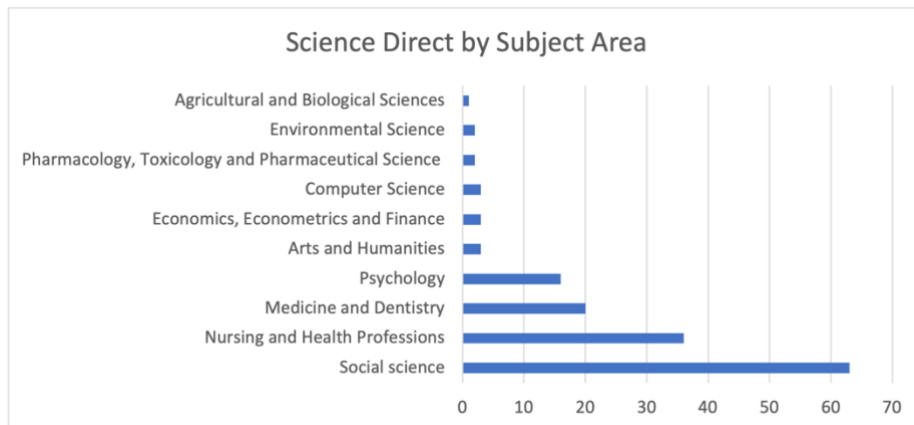


**Fig. 2.** Subject area distribution of the documents found in Scopus.



**Fig. 3.** Subject area distribution of the documents found in Web of Science.

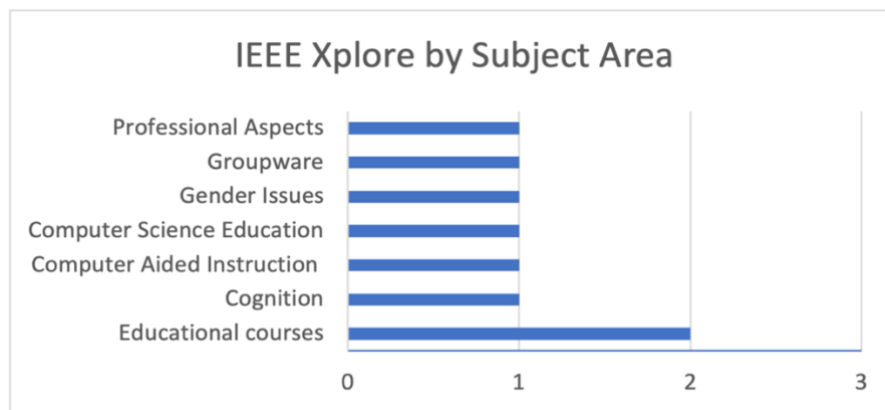
Fig. 3 indicates that most of the documents found in Web of Science database are related to Education/Educational Research (35).



**Fig. 4.** Subject area distribution of the documents found in Science Direct.

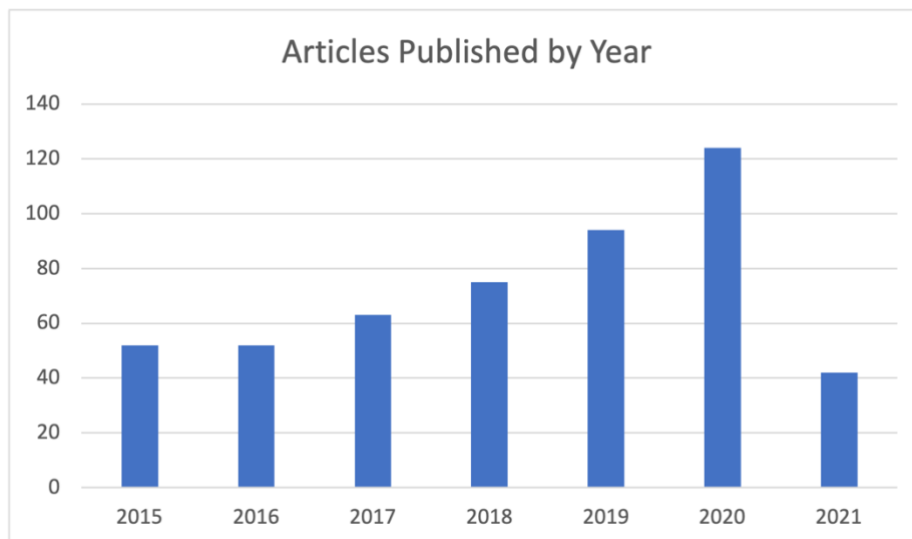
Fig. 4 indicates that most of the documents found in Science Direct database are also related to Social Science (63).

We found 4 documents in IEEE Xplore (Fig. 5), most of them related to Educational Courses.



**Fig. 5.** Subject area distribution of the documents found in IEEE Xplore.

On Fig. 6 a growing tendency can be observed in the number of publications that contain the terms "Student experience" and "Emotions"/"Affective" over the years. We can infer that the number of articles published until the end of 2021 will increase significantly; of the date of this document (April 2021), 42 articles have already been available in the databases consulted.



**Fig. 6.** Total number of publications per year indexed in the five databases.

### 3.3 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 3. As indicated in Table 4 the study was limited to higher education experiences, at undergraduate level.

**Table 3.** Inclusion criteria for this review.

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

**Table 4.** Exclusion criteria for this review.

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

We fully analyzed only a selected number of articles, that we found more relevant for our 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 [12, 13, 14, 15, 16, 17, 18]. 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.

## 4 Answering the Research Questions

### 4.1 RQ1: What kind of topics address the emotions in SX?

The students' experiences are developed in a wide range of topics, such as: learning [19, 20, 21, 22], role of services [23], educational transition [24, 25], and engagement [26, 27, 28]. 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 [19].



#### 4.2 RQ2: How do emotions affect SX?

Regarding the impact of emotions in SX, the role of emotions in learning experiences is the most discussed aspect in the literature. Reizenzein & Döring have proposed that emotions have three properties: i) immediate awareness, ii) phenomenal quality, and iii) intentionality [12]. 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 [20]. Troop et al. have investigated User eXperience Design Learning (UXDL) and have observed its effect on student motivation, which improves their learning outcomes [21]. This is due to the effect of the material design that encourages the learner's attention to relevant information [16], and the willingness to engage with these material [17].

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 [22].

The role that services has 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 [23]. The need for empathic interaction is especially evident in culturally diverse students on campus, as this affective component helps them adapting [15].

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 [14, 18, 24, 26]. Cownie highlight 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 [27].

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 [25]. Similarly, Parker mentions how emotions influence the late stages of the student's journey, reflecting on the students' professional identity [28]. 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.

#### **4.3 RQ3: What methods are used to evaluate emotions in SX?**

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 [19]. This process used the sentiment dictionary Multi-Perspective Question Answering (MPQA) [13]. The authors highlight how negative emotions are one of the main reasons for student to dropping 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 [23]. This can be a problem if we consider that the SERVQUAL dimensional instability has been reported [29, 30, 31].

## **5 Conclusions & Future Work**

The importance of emotion analysis from early to late stages of the student's experiences is evident. This considering the role they have as: i) inhibitors or enhancers of engagement, ii) agents that enhance or diminish motivation and attention, and iii) elements that facilitate empathic communication between subjects. All of these roles have a proven impact on academic outcomes and student well-being.

Interestingly, there's a lack of articles that analyze the impact of emotions on SX from a CX perspective. This does not prevent the identification of factors related to CX in the articles we have analyzed, such as physical or emotional interactions between students and actors from the academic environment. These interactions are carried out directly between subjects and services, or through the use of graphic study material.

The generalized use of self-reported methods to collect information regarding the emotional experience of students, such as questionnaires and interviews, is also observed. This can be a problem given the length and particularity of the student journey. For this reason, we believe that it is more appropriate to analyze the temporal evolution of the emotional impact throughout the student's journey, rather than carry out evaluations at the end of it.

Given the lack of articles with a CX perspective and the lack of a continuous evaluation of the emotional impact on SX, we find it necessary to carry out future work on the matter. We hope to identify mechanisms to evaluate the emotional impact on students, throughout the touchpoints of their journey as customers. In this way the analysis will be more accurate, as it will better adjust to the specificity of each journey.

Due the lack of definition of SX from a CX perspective, we intend to carry out a systematic literature review on SX definitions, aspects, and evaluation methods.

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