The Impact of Service Employees and Servicescape on Customers’ Perception of Quality Improvement Efforts

The present study contributes to the understanding of the influence of service employees and the tangible components of the service production and delivery system on perceptions of quality improvement efforts in a service organization. A hierarchical multiple regression with interaction analysis was performed on data collected from a convenience sample of 435 respondents in a higher education institution to assess the main effect of service employees and servicescape, as well as their interactive effect, on customers’ perception of the institution’s quality improvement efforts. The results show a significant effect of service employees, servicescape as well as the interaction between service employees and servicescape in their influence on customers’ perception of quality improvement efforts. The results also reveal that the servicescape intervenes as a moderator variable in the relationship between service employees and quality improvement efforts. Service organizations should therefore focus on the crucial role of service employees during the service encounter and recognize the importance of the servicescape, in view of increasing customers’ favourable perceptions towards the service organisation’s capability to provide better quality in order to satisfy their needs. The study has limited generalization given the convenience sample and the great variety of service industries. It would be helpful to realize similar studies in other service settings and to explore the exact nature of the interaction between service employees and servicescape.

Keywords: Service Employees, Servicescape, Quality Improvement Efforts.

Introduction

For all business organizations concerned with meeting customers’ needs and expectations, quality improvement remains one of its strategic objectives (Buzzel and Weirsema, 1981; Jiju, 2015; Kettunen, 2008; Shin et al., 2016). To achieve this objective and in the hope of remaining highly competitive in the marketplace, numerous organizations have launched quality improvement efforts (Paltayanian et al., 2012). In the literature, a distinction between quality improvement and quality improvement efforts is noted. While quality improvement is an outcome, quality improvement efforts are considered a body of actions or the total work done by an organization to achieve a particular end. In this study, we focus on the latter concept in the context of services.

A review of the literature reveals that the vast majority of research has focused on quality improvement, but very little on quality improvement efforts. Most studies on quality improvement have examined both its causes and consequences. This work was conducted from an internal perspective; their scope was thus defined within an organization’s boundaries. For example, several scholars have looked into the factors supporting quality improvement, such as working methods (Maiga and Jacobs, 2006; Wright, 2013), technologies (Hareton et al., 2007) and organizational learning (Savolainen and Haikonen, 2007). Meanwhile, other authors have examined the impact of quality improvement on
organizational performance and operational efficiency (Xiaosong et al., 2011) or financial performance (Chatzoglou et al., 2015; Heavey et al., 2014). Concerning quality improvement efforts, it is likely that it can influence the organization’s external environment, in particular customers’ attitudes and behaviours, such as customer satisfaction (Nabavi et al., 2014; Shin et al., 2016) and customer loyalty (Prentice, 2013; Santouridis and Trivellas, 2010).

In the context of service organizations, service employees and servicescape are considered as two crucial elements that determine the success of the service production and delivery system (Berry, 2000; Bitner, 1992). Because of the intangible nature of services, customers are confronted with the absence of quantifiable and measurable attributes in their evaluation process, thus they tend to use tangible elements associated with the service encounter, which are precisely service employees and servicescape. In previous studies, the individual and interactive effects of service employees and servicescape on customers’ perception of quality improvement efforts have not been extensively addressed (Nilsson and Ballantyne, 2014). Due to strong competition in the higher education sector, universities and colleges alike often establish their positioning strategy based, among other things, on the distinctiveness of faculty members (service employees) and their physical facilities (servicescape). These elements helps to demonstrate their ability to fulfill their mission, to retain current students and in the recruitment of new candidates. This strategy based on the organization’s distinctiveness in the marketplace is a well-known practice (Busse and Wallenburg, 2011; den Hertog et al., 2010). In this study, in a higher education service setting, we investigate the contribution of servicescape in enhancing the effect of service employees on students’ perception of quality improvement efforts. Since service employees and servicescape form an integral part of the service encounter, they should act upon the customer’s perception in a complementary manner (Lovelock and Wirtz, 2011; Zeithaml et al., 2013).

To our knowledge, the exact nature of the interdependence between service employees and servicescape is still unspecified in the literature. Nonetheless, there is an evolving stream of research that recognizes the significant role of service employees and the tangible nature of the service engagement platform in the co-creation of value (Leclercq et al., 2016; Prahalad and Ramaswamy, 2004). Similarly, the foundational premises of the service dominant logic recognizes the importance of employee skills and knowledge, the customer’s participation in the service production process, as well as the interactional elements that produce a service in the co-creation of value (Vargo and Lusch, 2008; Lusch and Vargo, 2014).

In adhering to the service dominant logic of marketing, this study aims to contribute to a better understanding of the impact of service employees and servicescape on customers’ perception of quality improvement efforts, as well as there interactive effects. From a managerial perspective, it aims to assist in the formulation of policies and strategies through the judicious use of human resources and physical environment during the service encounter. To that end, the study consists of four parts. Firstly, an overview of the nature of quality
improvement efforts is provided, followed by service employees and servicescape. Secondly, the investigation methods are explained. Thirdly, the results are presented and discussed. Finally, the theoretical and managerial implications concerning the reinforcement of customers’ perception of service quality improvement efforts are discussed.

Literature Review

Service Quality Improvement Efforts

The concept of service quality has been the concern of numerous studies during the last several decades, from its conceptualization (Grönroos, 1984; Parasuraman et al., 1985), its measurement (Bolton and Drew, 1991; Crónin and Taylor, 1992; Parasuraman et al., 1988), along with its antecedents and consequences (Anderson et al., 1994; Ganguli and Roy, 2011; Giovanis et al., 2015; Martin, 2016; Prentice, 2013; Rauyruen and Miller, 2007; Rust et al., 1995).

Several definitions of service quality are found in the service management and marketing literature. Service quality is defined as “a perceived judgment, resulting from an evaluation process where customers compare their expectations with the service they perceive to have received” (Grönroos, 1984, p. 38) or as “the degree of discrepancy between customers’ normative expectations of the service and their perceptions of the service performance” (Parasuraman et al., 1988, p. 17) or as the consumer’s overall impression with regard to its superiority (Bitner and Hubbert, 1994). Overall, service quality is seen as a gap between expectations and outcomes.

A review of the literature reveals that several authors have examined the individual influence of service employees (Dean and Rainnie, 2009; Wu et al., 2015) servicescape (Reimer and Kueln, 2005; Rosenbaum and Massiah, 2011) on customers’ perception of quality. Nevertheless, there is very little empirical evidence on the impact of service employees, servicescape and their interactive effects on customers’ perception of the efforts made by an organization to improve quality.

Quality improvement efforts is an important aspect of quality management. Some research on quality improvement has focused on the attributes of the product or service (Nilsson-Witell et al., 2005). With the advent of total quality management, quality improvement efforts must also be based on other elements, such as the environment, the employees and the process that directly affect the quality of the product or service (Oprime et al., 2012; Slatten, 2010).

Within a service organization, quality improvement efforts are a formal approach to the analysis of the performance of the service production and delivery system, whose objective is to assist management with key decisions aimed at improving quality. These resulting efforts must be translated into concrete results for the benefit of customers. Due to the intangible nature of a service, its tangible elements play a significantly larger role on the efforts made to improve quality.
These elements can be grouped into two components of the service production and delivery system: service employees (Dean and Rainnie, 2009; Elmadag et al., 2008; Sharabi, 2013), responsible for the delivery of service, and servicescape (Hooper et al., 2013; Kok et al., 2015; Nilsson and Ballantyne, 2014), the physical environment where the service is performed.

From a relationship marketing perspective, it is therefore crucial for the service organization to send a clear message to the marketplace that quality improvement efforts are made on an ongoing basis, in order to reassure consumers of its desire to meet or exceed their expectations. From this perspective, a better knowledge of the consumer’s perception of these efforts plays a pivotal role in quality improvement (Chaplin and O’Rourke, 2014).

Service Employees

A service is the outcome of the interaction between the customer, employee and servicescape (Zeithaml et al., 2013). In the service encounter, “service employees play a predominant role, along with customers, and have to accomplish tasks planned and specified in a script describing the role of each participant during the course of operations” (Nguyen and LeBlanc, 2002, p. 245). The important role of service employees during the service encounter has been acknowledged in the literature (Tombs and Rao Hill, 2014). Indeed, the actions of service employees affect greatly customers’ perception (Wu et al., 2015). In general, their role is twofold: gathering information and serving customers (Aldrich and Herker, 1979). Because of their strategic position, service employees receive different kinds of information from customers, mostly related to the service offering and delivery procedures. These types of information may be helpful to management while they attempt to improve service quality. Therefore, the direct contact employees have with customers as well as their knowledge of the service production and delivery system make them an important source of information for the organization. Moreover, as representatives of the organization they have a marketing role that influences relations with customers. Many service employees are considered part-time marketers, because they “conduct marketing activities but do not belong to the marketing or sales department” (Gummesson, 1991: 60). They are trained to meet the customer’s expectations and to protect the organization’s interests. According to the structure of the service offering, service employees can be divided into two groups: the main staff responsible for providing core service and support staff responsible for providing peripheral services.

The performance of service employees largely depends upon their ability to produce and deliver the service offering that satisfies the customers’ needs and expectations (Zeithaml et al., 2013). A service organization wishing to undertake quality improvement efforts must focus on enhancing their competence (Delcourt et al., 2013) and benevolence (Lee et al., 2004), two major determinants of trust put into practice during the service encounter, or even their physical appearance.
(Söderlund and Rosengren, 2008; Tombs and Rao Hill, 2014). By doing this, the organization seeks to ensure that customers have positive perceptions towards its efforts to improve quality and, ultimately, customer loyalty (Vlachos et al., 2013).

Hence, the first hypothesis:

\[ H_1: \text{The more positive the customer’s perception of the ability of service employees, the greater is his/her perception of the organization’s efforts to improve service quality.} \]

**Servicescape**

The servicescape is the physical environment where a service is produced and consumed (Baker, 1987; Bitner, 1992). In general, the production and consumption of service takes place simultaneously in the servicescape created and controlled by the service organization. The servicescape is considered the packaging of services, and has three components: ambient conditions, spatial layout, and decor and orientation signals (Bitner, 1992). Ambient conditions are the various elements such as colour, light, temperature, noise, odour and music, all of which might have the potential to affect the customers’ five senses, which influence their perception as well as their response to the environment. For example, Lee et al. (2018), show that the use of gold-related colour bill folders and tabletops in a restaurant setting has a positive impact on the patron’s tipping behaviour. Biswas and Szocs (2019, p. 47), for their part, reveal that low volume music/noise leads to an increase of healthy food choices in restaurants due to induced relaxation and that high volume music/noise increases excitement levels, leading to unhealthy food choices. Spatial layout is the design and arrangement of buildings, equipment, and furniture according to the needs of the service delivery process. Decor and orientation signals are visual symbols used to create an appropriate atmosphere and direct customers during the service encounter. Traditionally, the servicescape has not been considered as important as service employees have by management in service organizations. However, recently, researchers have underlined its influential role in the service production and delivery system and its potential to affect the customer’s behavior towards the organization (Daunt and Greer, 2015; Rosenbaum and Massiah, 2011).

From the customer's perspective, reactions to the servicescape can be categorized according to three levels: cognitive, physiological and emotional (Bitner, 1992; Tombs and McColl-Kennedy, 2003). At the cognitive level, the customer finds in the servicescape various non-verbal cues, which communicate the nature of the service offering and the value of the service provider’s reputation. The physiological reaction, for its part, is a result of the ambient conditions present in the setting. It may cause comfort or discomfort during the service encounter, which encourages the customer to pursue or interrupt service consumption, and consequently may have an influence on his attitudes and behaviours towards the service provider (Donovan and Rossiter, 1982). Finally, the servicescape may elicit an emotional reaction that can also affect attitudes and
behaviour (Mattila and Wirtz, 2001; Mehrabian and Russell, 1974).

A service organization wishing to implement quality improvement efforts associated with the servicescape in order to improve quality must therefore focus on the elements that promise to ensure favourable perceptions of customers toward the organization, such as the design, the layout and the technology used during the service encounter (Hooper et al., 2013; Psomas et al., 2011). Therefore the second hypothesis:

\[ H_2: \] The more positive the customer’s perception of the servicescape, the greater is his/her perception of the organization’s efforts to improve service quality.

**Interactive Effect of Service employees-Servicescape on Quality Improvement Efforts**

A service is the result of the social interaction between employees and customers that takes place in a physical setting. Servicescape can influence both the employees’ performance (Ali et al., 2015) and customers’ attitudes and behaviours (Zeithaml et al., 2013). From an internal perspective of the organization, it is important to understand the nature of the interdependence between service employees and servicescape in order to improve quality.

Previous studies have separately examined the influence of service employees (Dean and Rainnie, 2009; Wu et al., 2015) and servicescape (Hooper et al., 2013; Mattila and Wirtz, 2001) on customers’ perceptions of quality. In this study, these two components of the service production and delivery system are combined in assessing their effect on customers’ perception of quality improvement efforts. The foundational premises of the service dominant logic of marketing proposed by Vargo and Lusch (2008) and Lusch and Vargo (2014), recognize the important role of employee skills and knowledge, the customers participation in the service production process as well as the interactional elements that produce a service output in the co-creation of value. Dollinger et al. (2018, p. 219), in their work on the co-creation of value in higher education, report that the nature of the quality of the interactions has traditionally investigated the student-faculty relations. The interaction between service employees and servicescape merit investigation since they have the potential to impact on customers’ perception of quality improvement efforts. In recognizing the interactive effect of service employees and servicescape on customers’ perception of quality improvement efforts, it is expected that the ability of employees to improve quality can be enhanced if they work in an environment that is well designed to meet their specific needs during the service encounter. This enhanced ability should have a positive impact on customers’ perception of the organization’s efforts to improve quality and, in turn, lead to loyalty. Accordingly, the third hypothesis is formulated:

\[ H_3: \] The customer’s perception of servicescape will moderate the relationship between his/her perception of the ability of service employees and his/her
perception of the organization’s efforts to improve service quality.

The proposed links between service employees, servicescape and service quality improvement efforts are graphically presented in Figure 1.

**Figure 1.** Relationship between Service Employees, Servicescape and Perception of Quality Improvement Efforts

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**Method**

**Sample**

Data for this study was collected in a university situated in eastern Canada. As this is an exploratory study, the sample used came from a single university in the region. Convenience sampling was used, based on the list of courses of the 3rd and 4th years of the undergraduate programs, and from the graduate programs of several faculties. Questionnaires were distributed during a two-week period in randomly chosen classes. The questionnaires included an explicative note and contact information. The final sample was composed of 435 respondents, 41% of which were male and 59% female, 87% undergraduate students and 13% graduate. Overall, 55% were enrolled in the social sciences and humanities programs while 45% were in sciences and engineering. In all, 82% were Canadian students and the other 18% international students.

**Analysis Procedure**

The assessment of the main influence of service employees and servicescape, and their interactive effect on the customer’s perception of quality improvement efforts was conducted by the procedure proposed by Taylor (1997), based on hierarchical multiple regression with interaction. This procedure seeks to detect the presence of potential higher order terms and, if need be, to include them in the
regression model. Taylor (1997: 173) has underlined that “failing to capture true higher order and/or interaction effects can lead to problems associated with interpreting regression coefficients, particularly as importance weights.” In the context of the current research, the regression model relating two independent variables to a dependent variable takes the form as follows:

\[ IE = \beta_0 + \beta_1 SE + \beta_2 SC + \beta_3 SE*SC + \text{POTENTIAL HIGHER ORDER TERMS} + \epsilon \]  

Where:

- \( IE \) = Customer’s perception of quality improvement efforts made by the service organization
- \( SE \) = Customer’s perception of the performance of service employees of the service organization
- \( SC \) = Customer’s perception of the servicescape of the service organization
- \( SE*SC \) = Interaction between service employees and servicescape
- \( \text{HIGHER ORDER TERMS} \): A set of higher order terms up to cubic form as well as other interaction effects.

**Measurement**

A review of the literature reveals the absence of valid scales of service employee and servicescape. We note, however, the existence of various scales developed specifically for certain characteristics of service employees such as competence and trust, but not for service employees as a whole. There are, for example, multi-item scales developed for B2B seller competence (Rosenzweig and Roth, 2007), new service development competence (Menor and Roth, 2007), enterprise resource planning competence (Stratman and Roth, 2002) or network competence (Ritter et al., 2002). Concerning servicescape, a multi-item scale has recently been proposed for the educational sector (Goi and Kalidas, 2015). However, this scale is applied to a specific higher education institution and has dimensions unrelated to servicescape as defined in the literature. Nonetheless, two items from this scale, parking and restaurant, were retained in this study. Let us remember that the purpose of this research is not to develop multi-items scales. In this context, to quantify these concepts as presented in equation [1] we used direct measures.

The selection of items to assess service employees and servicescape in the present research was based on the meaning of each construct as recognized in the literature and the dimensions identified by a focus group carried out with students. The focus group was conducted with eight members, four men and four women, ranging in age from 20 to 32. The discussion, led by a researcher, lasted one hour and a half, and covered various issues surrounding educational services provided by the university with a focus on faculty members, other employees and physical facilities. The information generated corresponds largely to the definition of these constructs in the literature. One can observe the similarity between certain
dimensions of the service quality measurement scale, SERVQUAL, (Parasuraman, Zeithaml & Berry, 1988). This overlap is explained by the fact that service quality is a concept that incorporates the performance of employees and physical facilities. However, the purpose of this study is to measure perceptions of quality improvement efforts that, in turn, lead to the outcome.

First, five items were used for the measurement of service employees. Three items are for the group of employees having a leading role in the service production and delivery system: expertise of faculty members, their teaching ability and their willingness to supervise students. Two other items for other employees in their supporting role were included: staff responsiveness and willingness to help students. Second, eight items were chosen to describe various components of servicescape: comfort and layout of classrooms, equipment and technology used in classrooms, equipment and technology used in other services, comfort and layout in library, sports facilities, student residences, cafeteria and other food services, and parking space.

Finally, six items were used to describe the efforts made by the organization to improve quality: institution making efforts to offer better study programs, institution-taking actions to improve service quality, management being well informed about novelty in higher education, management promoting continuous renewal, work philosophy based on continuous renewal and management encouraging employees to adopt continuous renewal. Appendix I shows the 19 items used in this study.

Since the constructs examined in the present study are multidimensional, the advantage of these measures lies in the use of indexes formed from multiple indicators that are summed and averaged rather than a single-item measure (Taylor and Baker, 1994). All the measures are presented in a statement on a bipolar seven-point agreement responses with anchors of strongly disagree (1) and strongly agree (7). The correlation matrix of these items, presented in Table 1, shows that Spearman’s correlation coefficients between the measures within a specific concept (varying from 0.214 to 0.764) are generally greater than those between the measures from different concepts (varying from 0.107 to 0.467). In addition, Table 2 shows adequate values of Spearman’s item-index correlation (between 0.485 and 0.886). The assessment of the discriminant validity of the two indexes SE (for service employees) and SC (for servicescape) used as independent variables in equation [1] was performed according to the procedure proposed by Fornell and Larcker (1981) by comparing the values of average variance extracted (AVE) of each index to their squared correlation coefficient.
### Table 1. Correlation Matrix of the Items Used in the Model

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<td>0.352</td>
<td>0.406</td>
<td>0.414</td>
<td>0.315</td>
<td>0.294</td>
<td>0.327</td>
<td>0.221</td>
<td>0.219</td>
<td>0.295</td>
<td>0.356</td>
<td>0.244</td>
<td>0.561</td>
<td>0.606</td>
<td>0.743</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IE5</td>
<td>0.386</td>
<td>0.452</td>
<td>0.410</td>
<td>0.412</td>
<td>0.392</td>
<td>0.319</td>
<td>0.318</td>
<td>0.400</td>
<td>0.381</td>
<td>0.231</td>
<td>0.266</td>
<td>0.427</td>
<td>0.276</td>
<td>0.608</td>
<td>0.685</td>
<td>0.764</td>
<td>0.739</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IE6</td>
<td>0.400</td>
<td>0.463</td>
<td>0.465</td>
<td>0.338</td>
<td>0.336</td>
<td>0.275</td>
<td>0.247</td>
<td>0.281</td>
<td>0.173</td>
<td>0.204</td>
<td>0.288</td>
<td>0.452</td>
<td>0.250</td>
<td>0.490</td>
<td>0.582</td>
<td>0.645</td>
<td>0.625</td>
<td>0.733</td>
<td></td>
</tr>
<tr>
<td>MEAN</td>
<td>5.15</td>
<td>4.42</td>
<td>5.09</td>
<td>5.15</td>
<td>4.71</td>
<td>4.83</td>
<td>5.27</td>
<td>5.00</td>
<td>5.63</td>
<td>5.25</td>
<td>4.49</td>
<td>3.86</td>
<td>2.73</td>
<td>4.88</td>
<td>4.40</td>
<td>4.42</td>
<td>4.62</td>
<td>4.42</td>
<td>4.52</td>
</tr>
<tr>
<td>S.D.</td>
<td>1.34</td>
<td>1.51</td>
<td>1.20</td>
<td>1.24</td>
<td>1.57</td>
<td>1.47</td>
<td>1.35</td>
<td>1.21</td>
<td>1.31</td>
<td>1.34</td>
<td>1.30</td>
<td>1.70</td>
<td>1.81</td>
<td>1.28</td>
<td>1.37</td>
<td>1.38</td>
<td>1.20</td>
<td>1.27</td>
<td>1.36</td>
</tr>
</tbody>
</table>
To do this, a confirmatory factor analysis (CFA) was performed on thirteen measures used for the two indexes (five for SE and eight for SC). With loading coefficients of 0.688, 0.651, 0.610, 0.541 and 0.503 for SE, and 0.807, 0.771, 0.701, 0.671, 0.634, 0.615, 0.612 and 0.524 for SC, the AVE values of the two indexes (0.686 for SE and 0.793 for SC) were both above their squared correlation coefficient (0.199). With acceptable Cronbach’s alpha values of these indexes (between 0.767 and .919) and considering the exploratory nature of the present study (Nunnally, 1978), these results constitute a demonstration, although partial and limited, of the validity and the reliability of the used measures.

Table 2. Coefficients of Spearman Correlation Inter Index-Item and Cronbach’s Alpha Coefficients

<table>
<thead>
<tr>
<th>Indices (Construct)</th>
<th>Items</th>
<th>Spearman</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE</td>
<td>SE1 (Expertise of faculty members)</td>
<td>0.734</td>
<td>0.774</td>
</tr>
<tr>
<td></td>
<td>SE2 (Ability of teaching of faculty members)</td>
<td>0.745</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SE3 (Student supervision by faculty members)</td>
<td>0.728</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SE4 (Staff responsiveness)</td>
<td>0.685</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SE5 (Staff willing to help)</td>
<td>0.682</td>
<td></td>
</tr>
<tr>
<td>SC</td>
<td>SC1 (Comfort and layout of classrooms)</td>
<td>0.694</td>
<td>0.767</td>
</tr>
<tr>
<td></td>
<td>SC2 (Equipment and technology used in classrooms)</td>
<td>0.728</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SC3 (Equipment and technology used in other services)</td>
<td>0.667</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SC4 (Comfort and layout in library)</td>
<td>0.605</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SC5 (Sports facilities)</td>
<td>0.571</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SC6 (Student residences)</td>
<td>0.603</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SC7 (Cafeteria and other food services)</td>
<td>0.592</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SC8 (Parking space)</td>
<td>0.485</td>
<td></td>
</tr>
<tr>
<td>IE</td>
<td>IE1 (Institution making efforts to offer better study programs)</td>
<td>.919</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IE2 (Institution taking actions to improve service quality)</td>
<td>0.788</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IE3 (Management being well-informed about novelty in higher education)</td>
<td>0.855</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IE4 (Management promoting continuous renewal)</td>
<td>0.870</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IE5 (Work philosophy based on continuous renewal)</td>
<td>0.821</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IE6 (Management encouraging employees to adopt continuous renewal)</td>
<td>0.886</td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Coefficients of Spearman Correlation Inter Index-Item and Cronbach’s Alpha Coefficients
Table 3. Identification of the Nature of the Relationship Between the Perception of Quality Improvement Efforts and each Independent Variable

<table>
<thead>
<tr>
<th>Model</th>
<th>R²</th>
<th>p</th>
<th>F (d.f.)</th>
<th>Significance of Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>IE = 0.647 SE</td>
<td>0.418</td>
<td>0.000</td>
<td>F (1, 431) = 309.93</td>
<td>Significant quadratic term (p = 0.050)</td>
</tr>
<tr>
<td>IE = 0.667 SE + 0.074 SE²</td>
<td>0.423</td>
<td>0.000</td>
<td>F (2, 430) = 157.82</td>
<td>Significant quadratic term (p = 0.048)</td>
</tr>
<tr>
<td>IE = 0.636 SE + 0.091 SE² + 0.047 SE³</td>
<td>0.424</td>
<td>0.000</td>
<td>F (3, 429) = 105.24</td>
<td>No significant cubic term (p = 0.491)</td>
</tr>
<tr>
<td>IE = 0.578 SC</td>
<td>0.334</td>
<td>0.000</td>
<td>F (1, 431) = 213.52</td>
<td>No significant quadratic term (p = 0.269)</td>
</tr>
<tr>
<td>IE = 0.582 SC + 0.044 SC²</td>
<td>0.336</td>
<td>0.000</td>
<td>F (2, 430) = 107.43</td>
<td>No significant quadratic (p = 0.125)</td>
</tr>
<tr>
<td>IE = 0.482 SC + 0.063 SC² + 0.123 SC³</td>
<td>0.340</td>
<td>0.000</td>
<td>F (3, 429) = 72.88</td>
<td>No significant quadratic (p = 0.092) and no significant cubic terms (p = 0.092)</td>
</tr>
</tbody>
</table>
Results and Discussion

Following the procedure suggested by Taylor (1997), the results of identifying the (linear or curvilinear) nature of the relationship between the dependent variable (quality improvement efforts) and two independent variables (service employees and servicescape) are reported in Table 3.

As can be observed, the quadratic term associated only with service employees is statistically significant. In light of these results, the form of equation [1] connecting service employees and servicescape with quality improvement efforts and subject to testing is expressed as follows:

\[ IE = \beta_0 + \beta_1 SE + \beta_2 SC + \beta_3 SE*SC + \beta_4 SE^2 + \beta_5 SE^2*SC + \varepsilon \] [2]

The next step of the analysis procedure consists of estimating various regression models derived from equation [2] and evaluating the change in the coefficient of determination \( R^2 \) in a hierarchical manner conforming to the apparition order of the independent variables as specified. As the independent variables are closely related, the centred data have been used to attenuate the error caused by the potential problem of multicollinearity (Aiken and West, 1991; Cronbach, 1987). Table 4 presents the results of the hierarchical multiple regression analysis and the variance inflation factor (VIF) values estimated for various models.

**Table 4. Estimates of Various Regression Models from Equation [2]**

<table>
<thead>
<tr>
<th>Estimated Model</th>
<th>Variable</th>
<th>Beta</th>
<th>t-value</th>
<th>p-value</th>
<th>( R^2 )</th>
<th>VIF</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SE</td>
<td>0.476</td>
<td>11.632</td>
<td>0.000</td>
<td>0.496</td>
<td>1.40</td>
<td>0.71</td>
</tr>
<tr>
<td></td>
<td>SC</td>
<td>0.322</td>
<td>7.872</td>
<td>0.000</td>
<td></td>
<td>1.40</td>
<td>0.71</td>
</tr>
<tr>
<td>2</td>
<td>SE</td>
<td>0.490</td>
<td>11.997</td>
<td>0.000</td>
<td>0.506(^a)</td>
<td>1.42</td>
<td>0.70</td>
</tr>
<tr>
<td></td>
<td>SC</td>
<td>0.329</td>
<td>7.845</td>
<td>0.000</td>
<td></td>
<td>1.41</td>
<td>0.71</td>
</tr>
<tr>
<td></td>
<td>SE*SC</td>
<td>0.101</td>
<td>2.930</td>
<td>0.004</td>
<td></td>
<td>1.01</td>
<td>0.98</td>
</tr>
<tr>
<td>3</td>
<td>SE</td>
<td>0.472</td>
<td>10.350</td>
<td>0.000</td>
<td>0.507(^b)</td>
<td>1.77</td>
<td>0.56</td>
</tr>
<tr>
<td></td>
<td>SC</td>
<td>0.296</td>
<td>6.169</td>
<td>0.000</td>
<td></td>
<td>1.95</td>
<td>0.51</td>
</tr>
<tr>
<td></td>
<td>SE*SC</td>
<td>0.119</td>
<td>2.966</td>
<td>0.007</td>
<td></td>
<td>1.65</td>
<td>0.61</td>
</tr>
<tr>
<td></td>
<td>SE(^2)</td>
<td>-0.012</td>
<td>-0.286</td>
<td>0.775</td>
<td></td>
<td>1.58</td>
<td>0.63</td>
</tr>
<tr>
<td></td>
<td>SE(^2)*SC</td>
<td>0.049</td>
<td>0.924</td>
<td>0.356</td>
<td></td>
<td>2.39</td>
<td>0.42</td>
</tr>
</tbody>
</table>

\(^a\Delta R^2 = 0.01, F_{1, 431} = 8.68, p = 0.0034\)

\(^b\Delta R^2\) is not significant
These results reveal that the regression coefficients representing the main
effect of service employees and servicescape on customer’s perception of quality
improvement efforts is statistically significant in the presence of the interaction
term between service employees and servicescape (SE*SC). These results confirm
the hypotheses $H_1$ and $H_2$. The effect of service employees on the perception of
quality improvement efforts is more important than servicescape (beta of SE =
0.490 compared to beta of SC = 0.329 in model 2 in Table 4). This result suggests,
therefore, the crucial role of employees in the process of improving service quality
in higher education as mentioned in the literature (Sharabi, 2013). The presence of
the interaction term (SE*SC) means that the regression coefficients representing
the main effect of the two variables, service employees and servicescape, are the
weighted average effect of each variable across all observed values of the other
variable. For example, the regression coefficient of servicescape (beta of SC =
0.329 in model 2 in Table 4) indicates its effect on the perception of quality
improvement efforts at the average level of the evaluation of service employees,
calculated for all the customers of the sample. Let us underline the fact that this
average level is equal to zero since the centered data were used in the estimation
of the model.

Regarding the coefficient associated with the term SE*SC, it is statistically
significant and confirms the hypothesis $H_3$, but with small magnitude (beta of
SE*SC = 0.101 in model 2 and beta of SE*SC = 0.119 in model 3 in Table 4).
Because of the small magnitude and the exploratory nature of the study, this result
should be interpreted with caution. Despite this remark, the significance of the
interaction term found here is worth noting given the difficulty to detect
statistically reliable interactions as suggested by numerous researchers in the field
(Taylor and Baker, 1994). Consequently, we note that the presence of the
interaction between service employees and servicescape contributes to a better
explanation of the customer’s perception of quality improvement efforts.
Moreover, the results show that the effect of service employees increases when
servicescape is stronger (beta of SE = 0.476 comparing to beta of SE = 0.490
when beta of SC increases from 0.322 to 0.329 in the presence of SE*SC in
models 1 and 2 in Table 4). Consequently, these results suggest the moderator
role of servicescape in the relationship between service employees and quality
improvement efforts. Since the coefficient of the term SE*SC is positive, this
result can be interpreted as a congruence between perceptions of service
employees and servicescape. Statistically, the positive value of the coefficient
associated with the term SE*SC indicates that the interactive effect increases
(decreases) when the perception of servicescape increases (decreases). This result
demonstrates that service workers and servicescape are an integral part of the
service production and delivery system (Zeithaml et al., 2013), and they must be
jointly designed, developed and managed in quality improvement programs that
are linked with organizational values and strategy (Jha et al., 1996). In the context
of higher educational institutions, the inseparability between service employees
and servicescape seems even more obvious because of the need to provide an
environment conducive to exchanges between faculty members and students or

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Concerning superior order terms, the results in Table 4 show that their coefficients are not statistically significant. Therefore, these results allow us to conclude that the model without higher order terms is appropriate. The results presented in Table 4 also reveal that the change in the coefficient of determination ($\Delta R^2$) is statistically significant in the presence of the interaction term ($\Delta R^2$ is significant from model 1 to model 2 in Table 4).

**Conclusion**

*Theoretical Implications*

In light of the results obtained in this study, a service organization should put its focus on service employees and servicescape in order to ensure favourable perception of customers towards the organization’s efforts to improve the quality.

Regarding service employees, the continuous improvement of their performance should be a guideline in human resources management and several actions could be considered, such as strengthening their competence and encouraging their benevolence towards customers during the service encounter. To strengthen the competence of service employees, first, management must develop an environment that facilitates individual learning (Oprime et al., 2012) with the purpose of encouraging the acquisition and sharing of information and knowledge related to the service production and delivery system. From this perspective, a training program against industry best-practice standards must support the upgrading of specific knowledge held by each service employee periodically in order to enhance the customer’s perception of the service organization’s efforts to improve quality. In order to encourage service employees to adopt a benevolent behaviour towards customers, it is crucial for a service organization to put into practice ethical guides for them. By taking into consideration ethical elements, employees become more sensitive to the consequences of their actions regarding customers. This heightened sensibility would also allow them to detect and foresee latent or emerging conflicts during the service encounter. From the point of view of the customer, benevolence has numerous advantages for the service organization, particularly assuring the concordance between its decisions and its desire to improve quality. When the customer perceives a high level of benevolence on the part of the employees, he could provide them information never before revealed regarding his interests and needs. It is clear that this information might help the service organization to better satisfy the customer and to strengthen his perception of the organization’s efforts to provide better quality.

Concerning servicescape, because of its strong influence on the performance of service employees, it must be designed in response to two types of needs: operations needs, expressed by the maximisation of organizational efficiency, and marketing needs, to create an environment that influences customers’ attitudes and beliefs toward the service organization (Hooper et al., 2013). In reference to
operations needs, the spatial layout of the environment must aid in the accomplishment of both the employee’s and the customer’s tasks during the service encounter. The choice of the environmental layout can be made in taking into consideration two dimensions: space and time. Concerning the spatial dimension, management must be aware of potential employee-customer conflicts that may have a negative effect on the service performance. In general, employees wish to control their work place. A widely opened setting without access limitation to customers may produce physical and psychological disturbances in the employees work, especially in the cases where the service encounter is carried out in a limited space or in a badly designed environment. Regarding the temporal dimension, management in the choice of environment design must consider two important criteria: timing and speed of service. Given the perishability of most services - they are lost when not consumed at particular time and place - the setting design must take into consideration, for example, the demand for service offering, the acceptable waiting time for customers, and the critical moment effecting the success of the service delivery process.

With regard to the interactive effect service employees-servicescape on customers’ perception of quality improvement efforts, the service organization must build up its own quality improvement program based on a continuous renewal of knowledge helping to strengthen employees’ competence on an ongoing basis and, a servicescape designed to maximize the organizational efficiency and being distinctive from the competition. By emphasizing on the physical environment and combining it with employees’ expertise in the continuous quality improvement program, the service organization will maintain the outcome of its service production and delivery system up to customers’ expectations and, consequently, their favorable perception about the efforts made by the organization.

**Practical Implications**

In addition to the above theoretical insights, this study also presents empirical evidence about the need for higher education institutions to focus on both faculty members’ qualifications and physical facilities. Concerning faculty members, it is imperative to invest in human resources to develop and deliver high quality curriculum. For example, to maximize the contribution of faculty members, the institution should provide them with the means to renew continuously their skills to ensure a creative and effective teaching for students to acquire new knowledge to solve new problems (Sharabi, 2013). The institution should establish a permanent structure for the development of skills to maintain or increase its capital of competence (Bouteiller, 2009). On the one hand, this structure could focus on formal training practices for improving teaching skills or those associated with the optimal use of information technology and communication. On the other hand, this structure can also be directed towards informal training activities that promote meetings and discussion among faculty where the more experienced faculty would be asked to provide some guidance to new hires (Kelleher et al.
2019). In the case of a higher education institution, promoting benevolent behaviour among faculty members and other employees for the well-being of students means that the university or college is taking action to ensure the success of the learning process. This in turn helps to reinforce the perception among students that the institution is making efforts to provide better educational services.

Regarding servicescape, its improvement must be guided by a judicious choice of various elements such as comfort and layout of classrooms and library, equipment and technology used in classrooms and other services in order to provide better educational services. Due to strong competition, the use of physical environment in the positioning strategy contributes to create a unique distinctiveness.

**Limitations and Further Research**

The limits of the present study should not be ignored. First, the exploratory nature of this study does not allow for the generalization of the findings to all types of service settings because of the great variety in service industries, especially since the data were collected from a convenient sample. Secondly, the efficacy of the direct measures used in the evaluation of service employees, servicescape and quality improvement efforts must be considered (Peterson and Wilson, 1992). The selection of these measures was based on the meaning of each of the three constructs, in the absence of measurement scales. Thirdly, the hierarchical multiple regression with interaction method used here is not necessarily superior to other techniques to investigate potential higher-order and/or interactive effects (Jaccard et al., 1990; Taylor, 1997). For example, structural equation modelling with latent variables is a prominent alternative technique. However, this method, more complex, is not able to examine the subtle distinction between closely linked constructs (Iacobucci et al., 1994). Finally, the weak variation of the coefficient of determination should invite us to interpret the results with caution. Concerning future research, it would be helpful to realize similar studies in other service settings. Furthermore, it would be interesting to proceed with other studies to determine the exact nature of the interaction between service employees and servicescape. The work being presently done on the co-creation of value could be the starting point that leads to a better understanding of the interactive process in a «collective consumption context», (Kelleher et al., 2019).

**References**


Appendix I

Measures of service employees, servicescape and perception of quality improvement efforts

Service employees
- SE1 Expertise of faculty members
- SE2 Teaching ability of faculty members
- SE3 Willingness of faculty members to supervise students
- SE4 Staff responsiveness
- SE5 Willingness of staff to help students

Servicescape
- SC1 Comfort and layout of classrooms
- SC2 Equipment and technology used in classrooms
- SC3 Equipment and technology used in other services
- SC4 Comfort and layout of library
- SC5 Equipment and technology used in library
- SC6 Comfort and layout of student residence
- SC7 Equipment and technology used in student residence
- SC8 Availability of parking space

Perception of quality improvement efforts
- IE1 Institution making efforts to improve study programs
- IE2 Institution taking actions to improve service quality
- IE3 Management being well-informed about novelty in higher education
- IE4 Management promoting continuous renewal
- IE5 Work philosophy focused on continuous renewal
- IE6 Management encouraging employees to adopt continuous renewal