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HEISQUAL: A modern approach to measure service quality in higher education institutions

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ABSTRACT

Considering students as the key stakeholders in higher education institutions (HEIs), the present study identifies service quality (SQ) indicators from their perspectives and proposes a more comprehensive instrument for measuring SQ exclusively in HEIs. HEISQUAL covers the operational as well as technical aspects of SQ by following a holistic approach, which has largely been ignored in previous studies. The proposed instrument was subjected to different scale development tests where outcomes fully complied with the benchmark values and proposed seven SQ themes, namely teachers' profile, curriculum, infrastructure and facilities, management and support staff, employment quality, safety and security, and students' skills development.

1. Introduction

In the current highly competitive and dynamically changing global market, higher education institutions (HEIs) not only have to play their role in cultural and social development but also have a significant part in the national economy (Abbas & Sagsan, 2019). For this reason, HEIs have gradually turned into business-like organizations and have performance indicators for accountability and quality assurance (Brachem & Braun, 2018). HEIs are now more market-oriented and market-driven; therefore, they should be more concerned with customers' perception of quality and satisfaction, as quality in service is defined by customers and not by the organization itself (Li, 2018). The satisfaction of customers with the service quality (SQ) is one of the determinants of organizational success (Abbas, 2019; Campos, Santos, & Castro, 2017). Students are the primary customers of HEIs so their satisfaction must be ensured (Guilbault, 2018). With the introduction of student tuition fees, the UK government has also recognized students as customers (Brunce, Baird, & Jones, 2017). However, a number of researchers, such as Guilbault (Guilbault, 2018) and Tholen, Relly, Warhurst, and Commander (2016)), have opposed viewing students as customers and education institutions as business-like organizations. S. Liu (2016) stated that if students are accepted as customers, then HEIs must give them what they want, which may conflict with the delivery of quality in education.

Educational institutions, particularly HEIs, are responsible for training young generation(Brachem & Braun, 2018) and transforming them into valuable resources (Premand, Brodmann, Almeida, Grun, & Barouni, 2016). The significant increase in the participation rate of young generation in HE (Roser & Ortiz-Ospina, 2018) has resulted in the inability of public HEIs to accommodate all the students and paved the way for private HEIs. Consequently, hundreds of new public and private HEIs have been established across the world in the last two decades (Acer & Güçlü, 2017). Similarly, because of the internationalization of higher education, thousands of students travel each year to different countries to pursue better education (Jupiter et al., 2017). This development has resulted in more options for students in the selection of HEI and intensified the competition among HEIs to attract new and retain existing students (Truong, Pham, & Vo, 2016).

The massive increase in quantity represents a noteworthy threat to quality (Ali, Zhou, Hussain, Nair, & Ragavan, 2016). This substantial increase in the establishment of HEIs has resulted in the issue of quality in HEIs (Abbas, 2020b). For instance, Truong et al. (2016) stated that most of the students in private universities are dissatisfied with the quality of infrastructure and facilities available to them. Mok and Jiang (2017) said that because of massification of higher education (HE) a number of HEIs across the world have compromised on quality, such as proper training of students and availability of relevant facilities and equipment. This issue has resulted in the inability of students to efficiently perform in the industry. According to Abbas and Sagsan (2019), most employers believe that HEIs are lacking to impart required skills, abilities, and knowledge in students. For this reason, their employability has become a serious challenge.

SQ has critical importance for all organizations and it has a direct impact on their success or failure (Li, 2018). To judge and improve the SQ, it must be validly and reliably evaluated (Abbas, 2020a). However, a

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key issue in evaluating the SQ is the identification of quality indicators and the use of an appropriate measurement instrument (Silva, Hermínio, de Moraes, & Kanashiro Makiya, 2017). SERVQUAL by Parasuraman, Zeithaml, and Berry (1988), SERVPERF by Cronin and Taylor (1992), and HEdPERF by Abdullah (2006b) are the popular instruments used by researchers and the institutional management to measure SQ in HEIs. However, these instruments are either too general or do not address the modern aspects of SQ in HEIs. Consequently, for an instrument to be used in academia, one must modify and specifically relate it with HEIs (S. Liu, 2016, 2016b; Rózsa, 2010; Abbas, Muzaffar, Shoaib, & Mahmood, 2014).

The majority of the work on SQ in HEIs is focused on the mechanism of course delivery and quality of teaching (Galeeva, 2016; Silva et al., 2017) and limited attention has been given to identifying the comprehensive dimensions of SQ in HEIs using the holistic approach. For this reason, developing a comprehensive instrument which measures SQ specifically in HEIs by considering operational as well as technical aspects is still a major challenge (Ali et al., 2016). In the context of HEIs, operational quality refers to tangible as well as intangible facilities available to students during their stay at the university. It also focuses on how those facilities were offered to them. Technical quality refers to the degree to which the institution has trained its students as per the industry standards so that, after graduation, they can act resourcefully in the industry.

The present study aimed to design and validate an instrument that not only measures SQ exclusively in HEIs from the students' perspective but also eliminates the operational (process) and technical (final results) deficiencies identified in the prevailing scales. For this reason, the current research aims to identify the indicators of SQ in HEIs mainly from the students' perspective and develops and validates an instrument for the same purpose. It also explains how the identified SQ indicators are different from previously conducted studies. The next sections discuss the literature, followed by explaining the adopted methodology, data analysis and results, discussion, conclusion of the study.

2. Literature review

Quality in education is a multi-functional phenomenon and is influenced by changing trends, socio-economic forces, and the development of society. One of the challenges in ensuring SQ is the identification of appropriate SQ constructs. SQ and customer satisfaction are two fundamentally different but positively correlated concepts (Galeeva, 2016). The better the services offered by the institution, the more satisfied the students will be. Mahmood, Hashmi, Shoaib, Danish, and Abbas (2014) found a positive relationship between students' satisfaction with service quality and their motivation to learn. If students are satisfied with the quality of the provided services, they will be more motivated to actively perform in the learning phase (Jupiter et al., 2017). However, the repeated campus life experiences continuously shape the satisfaction or dissatisfaction of students (Ali et al., 2016). Class size, atmosphere and the learning approach adopted by students have been identified as potential influences on the overall experience of students (Mbise & Tuninga, 2016).

HEIs have to contribute more efficiently by considering the interests of governments, employers, and other stakeholders. HEIs must apply a stakeholders approach to understand the demands of various stakeholders (Habib, Abbas, & Noman, 2019) as, according to Awan, Kraslawski, and Huiskonen (2017), identifying and fulfilling stakeholders' demands can have a significant positive influence on institutional success. There are several internal and external stakeholders in HEIs, such as academic staff, students, parents, employers, government, funds providers, local and regional communities. However, it is believed by all researchers that students are the main customers and stakeholders in HEI (Galeeva, 2016). Therefore, SQ must be investigated from the students' perspectives in the right manners by identifying critical quality factors in tertiary education.

2.1. Problems with existing instruments

As per the literature, SERVQUAL, an instrument developed by Parasuraman et al. (1988), is the most popular among organizations and researchers for measuring SQ in different industries. The original formulation of SERVQUAL possessed 10 constructs, which was later modified to five dimensions, namely reliability (4 items), assurance (5 items), tangibles (4 items), empathy (5 items), and responsiveness (4 items). As per Parasuraman et al. (1988), SQ includes a comparison of perceived quality with expectations; hence, the theoretical foundation of SERVQUAL is a gap model considering the differences between customers' expectations, i.e. 'belief about the delivery of service as per standards', and perception of performance such as actual experiment of services through interaction with service providers.

There are multiple studies in the literature where researchers have criticized SERVQUAL for different reasons. One of the problems with SERVQUAL concerning HEI is that most of its items are too general and, to use it in academia, one must modify and specifically relate it with HEIs by identifying its determinants from students' perspectives (Abdullah, 2006b). The modified version of SERVQUAL for HEIs demonstrates lower reliability and poor factor structure (Trivellas & Dargenidou, 2009). Brochado (2009) said that the model of SERVQUAL is not suitable for HEIs, as services offered by HEIs are more multifaceted than other services such as restaurants and banking. Winsted (2000) recommended the use of better words for some of the SERVQUAL items. O'Neill and Palmer (2004) identified three psychometric setbacks linked with the use of SERVQUAL in HEIs, which are reliability, variance restriction, and discriminant validity.

The issues found in the SERVQUAL model led to the development of a performance instrument named SERVPERF by Cronin and Taylor (1992). SERVPERF is focused on the exclusion of expectations from SQ measurement and holds the view that SQ should be measured by taking only the perception of performance into account. One of the problems with SERVPERF is that it considers performance measures only and neglects most of the information from the operational point of view. SERVQUAL as well as SERVPERF models only consider functional quality elements and ignore the technical aspects (Kang, 2006). However, the SERVPERF approach is less popular among researchers in comparison to SERVQUAL. Similar to SERVQUAL, the content of SERVPERF is also too general and to use it in the education sector, one must modify and relate it by considering academic aspects (Abdullah, 2006a).

The HEdPERF and HESQUAL instruments developed by Abdullah (2006b) and Teeroovengadum, Kamalanabhan, and Keshwar Seebaluck (2016) are considered better than SERVQUAL and SERVPERF as they focus on the education sector. These instruments cover the academic and environmental aspects. Brochado (2009) found the HEdPERF instrument more reliable and valid in comparison to SERVPERF. However, these instruments also have not comprehensively addressed the SQ factors, particularly the technical aspects.

Despite the inability of SERVQUAL and other instruments to assess SQ in HEIs, limited attention has been given to identifying the comprehensive indicators of SQ in HEIs. To improve SQ, firms must be able to understand customer expectations and satisfaction. This can be done by taking feedback from customers using a comprehensive SQ instrument. The present study is relevant in the current environment of HEIs, which has experienced multiple social, political, technological and economic changes during the last two decades, and investigates the prominent themes of SQ from students' perspectives in the prevailing environment.

3. Methodology

3.1. Research design

As the aim of this study was to develop and validate an instrument

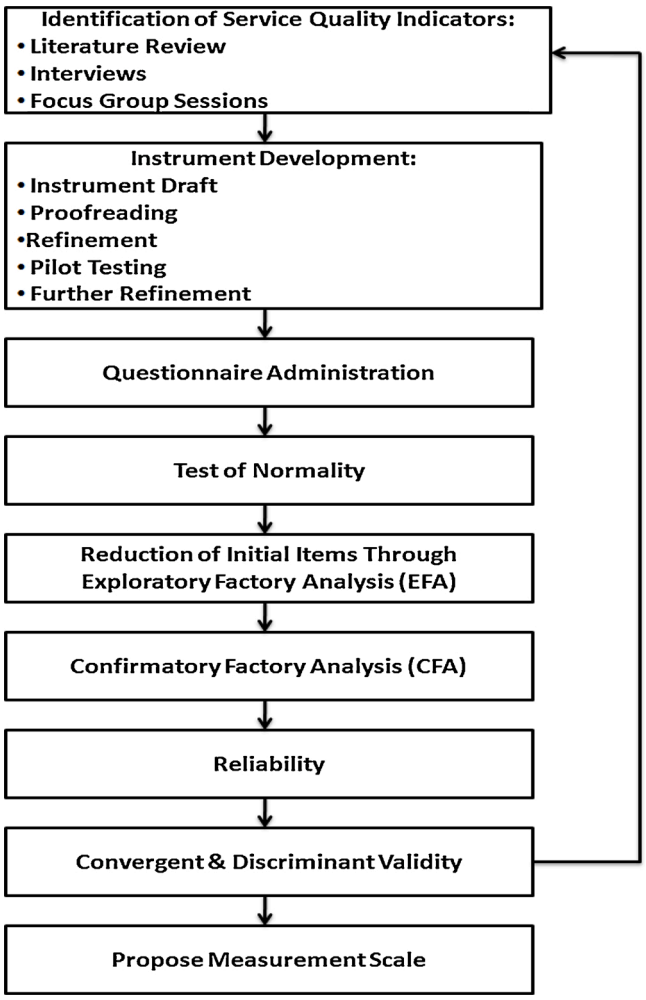

Fig. 1. Scale development steps.

which particularly focuses on SQ in HEIs from the students' perspective, the researcher adhered to pragmatic research philosophy and followed a mixed-method technique. In mixed-method research, qualitative and quantitative techniques complement each other to address the research problem. This technique has the strength to provide a complete and detailed understanding of the problem, offsets the weaknesses of qualitative and quantitative research, and also facilitates the development of a more context-specific instrument (McKim, 2017). In the first phase (qualitative phase), literature review, interviews, and focus group sessions enabled the researchers to identify the SQ factors from the students' perspective, which provided the foundation for designing the instrument. In the second phase (quantitative phase), the researchers validated the newly developed instrument. For this purpose, the guidelines proposed by Hinkin (1998) were followed and the scale development steps are given in Fig. 1.

3.2. Sampling and data collection

The target population of the study comprised of local and international students of HEIs located within Turkey. The researcher took comments of 43 students, comprising 14 females and 29 males, via interviews and focus group sessions. The sample of 43 students was selected via the non-probability convenience sampling technique from three HEIs located in the country. Only those participants who had attended a minimum of two semesters by the time of the interview and could communicate in the English language were recruited. The participants' ages were between 20 and 37 years and they were from both public and private HEIs. The potential participants were briefly informed about the objectives of the research in general and were given the option of a focus group session or an individual interview. Seventeen participants volunteered for focus group sessions and twenty-six opted for an individual interview.

Following Krueger's (2002) recommendation for 5–10 (preferably maximum 8) participants in each group, the researcher divided the focus group participants into three groups. The focus groups sessions were arranged by considering the participants' availability. In the first group, five males and one female from bachelors' program participated, whereas four males and two females from master program participated in the second session, and the last session was focused on PhD students in which four males and one female participated. The focus group sessions were arranged in the research office and meeting room of the respective universities. Each session was held with different people so that detailed information about the topic could be obtained from different perspectives. A similar approach was found in the study conducted by Teeroovengadum et al. (2016). The interviews and focus group discussions were conducted in a face-to-face format. Before starting the sessions, the researcher re-explained the objectives of the research to the participants and assured that their feedback would be used for the intended purpose, only. The following questions were asked to the participants;

1 What are the factors that constitute good service quality in higher education institutions?
2 What are the areas in which your institution is performing well?
3 What are the areas where your institution should improve?

The time taken for the interviews ranged from 3 min 52 s to 11 min and 2 s. The duration of the focus group one was 25 min and 24 s, while focus group two lasted 43 min and 11 s and focus group three lasted for 31 min and 35 s. The audio from all interviews and focus groups was recorded using a mobile recorder.

3.3. Qualitative data analysis and results

The researcher took qualitative data from 43 students (three focus group discussions and 26 individual interviews) by following unstructured approach. To obtain detailed information, the researchers followed up each question with a probe, such as "why" and "how". Most of the participants termed teachers' profile as the most important pillar of HEIs by referring to their behaviour with students, teaching style, communication skills, and subject knowledge. Many respondents highlighted elements relating to employment opportunities, infrastructure and facilities and behaviour of management and support staff. Upon making contact with the 43 participants and taking their opinions, the researcher realized that the explanations by different participants had become repetitive and had reached a saturation point. Hence, the researcher decided to stop collecting any further data. The qualitative data were analysed via deductive reasoning using narrative and framework analysis with open coding. Abbas and Sagsan (2019) and Pattinson, Cotterill, and Leyland. (2017) also followed a similar approach in their studies. The analysis of data identified seven major themes, namely teachers' profile, curriculum, infrastructure and facilities, management and support staff, employment quality, safety and security, and students' skills development. These themes were classified by considering their high level of reiteration in terms of keywords and phrases.

- ***Teachers' profile:*** Almost all the participants in the interviews and focus group sessions highlighted the fundamental role of teachers. A number of participants claimed that teachers' knowledge and teaching style are dominant indicators of SQ in HEIs. Some participants also emphasized the practical knowledge and industrial experience of teachers. Considering the focus of the discussion related to teachers' profile, this main theme was further divided into four dimensions, namely subject knowledge, communication skills, teaching style, and behaviour with students.
- ***Curriculum:*** Most of the participants focused on the importance of curriculum concerning understand-ability, comprehensiveness, and role in developing the skills required in the industry.
- ***Infrastructure and facilities:*** Similar to teachers' profile, many participants referred to infrastructure and facilities as one of the most important indicators of SQ. This theme was divided into three dimensions, namely learning facilities, supportive facilities, and cleanliness and maintenance.
- ***Management and support staff:*** Similar to teachers, students daily have to interact with the management and support staff of their institution. In this regard, the behaviour of management and support staff and the efficiency and effectiveness in their processes are highly important. Therefore, this theme was further divided into two dimensions, namely behaviour with students and administrative work.
- ***Employment quality:*** Because of the highly competitive job market and the dynamics of the industry, a large number of participants highlighted the important role of their educational institution in developing employability skills, providing employment training, and the links of their educational institutions with potential employers. For this reason, this theme was further divided into two dimensions, namely links with employers and employability training.
- ***Safety and security:*** Some students mentioned their concerns about the safety and security services offered by their HEI, particularly concerning facilities in the case of an emergency. This theme was also divided into two dimensions, namely security measures and safety equipment.
- ***Students' skills development:*** This theme is focused on the social and personal development aspects of students, as many students believe that, along with academic development, HEIs should also concentrate on students' personality development. This theme is divided into two dimensions, namely extra-curricular activities and personal development.

3.4. Instrument development

The draft of the questionnaire was prepared by considering the literature as well as interviews and focus group sessions transcripts. The number of items for each dimension ranged from three to six. The questionnaire was divided into two sections. Section one contained 67 items (reduced to 63 during exploratory factor analysis (EFA), details of which are given in EFA section) about different areas of services at HEIs and were measured on a seven-point Likert scale, where 1 represented strongly disagree and 7 represented strongly agree. Section two contained 9 questions related to the demographic information of the respondents. To take the experts' comments, the draft of the questionnaire was shared with 11 education and research experts in Turkey and the United Kingdom and improvements were made based on their directions. After proofreading, the scale was pilot tested by taking feedback from 25 students from HEIs located in Turkey.

3.5. Questionnaire administration

After the initial refinements (proofreading and pilot testing) and finalization of the instrument, a comprehensive survey was initiated in different public and private HEIs located in Turkey. The data were collected from November 2017 to January 2018 via getting in contact in person as well as online by making it available on "Google Drive". As the instrument was designed in the English language, only those participants who could understand the English language and had attended a minimum of two semesters by the time of the research were requested to fill the questionnaire. The researcher followed the non-probability convenience sampling technique to collect 437 completed questionnaires (113 online and 324 personal contacts), out of which 358 were usable. A detailed description of respondents is given in Table A1 in Appendix A.

4. Data analysis and results

After the collection of adequate data, it was entered into SPSS v. 23 for statistical analyses. The researcher began with normality test and initial screening of data as, according to Abdullah (2006b), the lack of normality of the data can lead to a reduction in correlation among variables. In the outlier screening process, 38 outliers were identified and removed. The 0.959 R^2 value of the study indicates that the study has normal data (Abdullah, 2006b). To ensure the feasibility of the data for further analyses, the correlation was checked. The visual examination of the correlation matrix helped to identify the statistically significant values and revealed that correlations were significant at $p = 0.01$. This further provided an excellent foundation for factor analysis. The adequacy of the sample for factor analysis was analysed using the Kaiser-Meyer- Olkin (KMO) test and the resulting 0.959 value perfectly complies with Kaiser and Rice's (1974) sample size requirements.

4.1. EFA

After the assurance of the data's appropriateness for factor analysis, EFA was performed. For this purpose, "principal component analysis" following "Varimax" rotation technique was used. Considering Hinkin (1998) suggestion, the researcher divided the overall sample into two subsamples to perform parallel analyses for scale development using EFA and CFA and to cross-validate the factor structure. Taking into consideration the desired parsimony and simple structure for the scale, the researchers decided to keep only those items which showed 0.4 or above inter-item correlation and loaded 0.4 or above on a single factor, meeting the Hair, Anderson, Tatham, and Black (2010) cut-off significance requirement of 0.3 or above. The seven identified themes were subjected to EFA. Since EFA assumes that all the items can be loaded to each factor, Awang (2012) suggested performing separate EFA for each construct. For this reason, the author performed multiple EFA for different scales detail of which is given below:

4.1.1. Teachers' profile

The EFA of teachers' profile proposed four sub-factors explaining 73.903 % of the variance. The sub-factors were named teachers' *subject knowledge,* which contained four items with 0.503 to 0.846 factor loadings*, communication skills* also contained four items with 0.601 to 0.807 factor loadings*, teaching style* possessed four items factor loadings ranging from 0.627 to 0.876, and *behaviour with students* was the fourth sub-factor with five items factor loadings being between 0.518 and 0.822. Sample items include: "My instructors have adequate knowledge to answer students' questions"; "I can easily understand the concepts explained by my instructors"; "My instructors explain the complex concepts easily and understandably"; "My instructors demonstrate non-biased and non-discriminating behaviour".

4.1.2. Curriculum

The factor analysis of curriculum explained 74.701 % of the variance

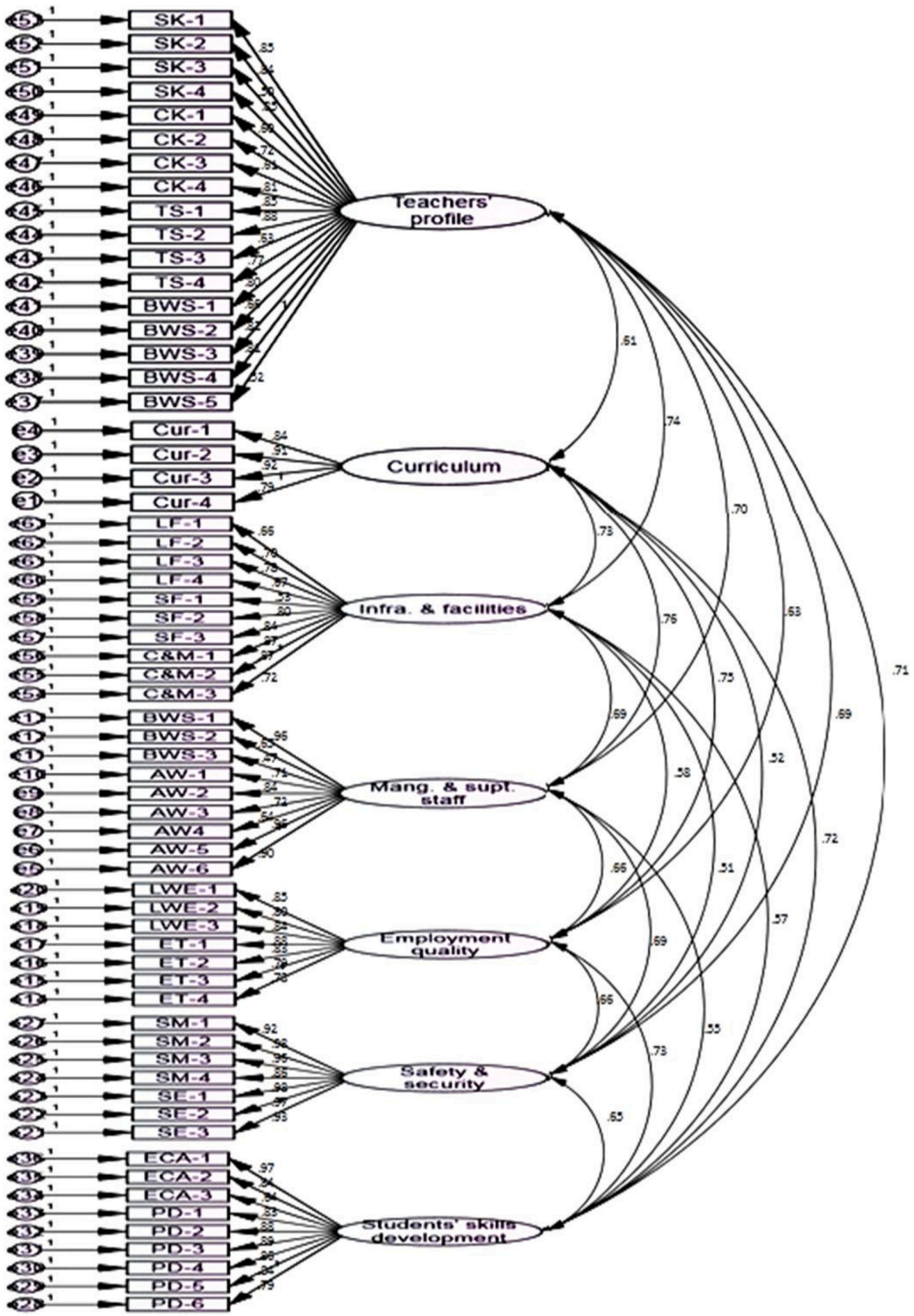

Fig. 2. Confirmatory factor analysis.

with a single dimension, which contained four items with 0.787 to 0.916 factor loadings. Sample items include: "The curriculum taught at my university is comprehensive and easy to understand"; "The curriculum taught at my university improves students' intellectual abilities (decision making, problem-solving)".

4.1.3. Infrastructure and facilities

This theme generated three dimensions named *learning facilities, supportive facilities*, and *cleanliness and maintenance,* which explained 59.69 % of the variance. Learning facilities contained four items with factor loadings ranging from 0.664 to 0.784. Factor loadings for supportive facilities were from 0.525 to 0.824. One item from this sub-factor was deleted because of poor factor loading. Cleanliness and maintenance also contained three items and their factor loadings ranged between 0.723 and 0.824. Sample items include: "My university has adequate library resources (books, magazines, newspapers, study space, furniture, access to online databases)"; "My university provides satisfactory transport, cafeteria, and bookshop services to students and staff members"; "My university has sufficient and well-maintained classrooms".

4.1.4. Management and support staff

The EFA of this theme generated two dimensions, namely *behaviour with students* and *administrative work* and all together, they explained 70.849 % of the cumulative variance. One item from behaviour with students was deleted because of the poor factor loading, making three items for this sub-factor with 0.466 to 0.962 factor loadings. Administrative work contained six items with factor loadings being between 0.641 and 0.964. Sample items include: "Management and support staff of my university deal with students in an appropriate manner"; "Admin and support staff of my university have effective communication skills".

4.1.5. Employment quality

Two dimensions were identified during the analysis of the employment quality theme and were named *links with employers* and *employability training.* One of the four items from links with employers showed a factor load below the cut-off level and was removed. The remaining three items showed factor loading from 0.802 to 0.847. Employability training possessed four items and loading between 0.781 and 0.811. In total, 69.899 % of the variance was explained by this dimension. Sample items include: "My university helps their graduates in finding jobs"; "My university has active job placement/work experience service for students".

4.1.6. Safety and security

EFA of this theme generated two dimensions, namely *security measures* and *safety equipment,* which explained 74.497 % of the variance. Security measures contained four items with factor loadings ranging from 0.924 to 0.966, while safety equipment had three items with 0.925 to 0.981 factor loadings. Sample items include: "My university ensures high standards of safety and security on campus"; "My university has installed an adequate number of fire extinguishers".

4.1.7. Students' skills development

The EFA of this theme proposed two dimensions, which were named as *extra-curricular activities* and *personal development.* One item from extra-curricular activities was deleted because of low factor loading and proposed three items with factor loading ranging from 0.664 to 0.967. The six items of personal development showed factor loadings between 0.787 and 0.884. Moreover, 75.484 % of the total variance was explained by this factor. Sample items include: "My university ensures adequate recreational and sports facilities"; "The atmosphere in my university instils leadership and active team player attributes in students". The details of the items' loadings are given in Table A2 in the Appendix A. Moreover, Table A3 in Appendix A compares SERVQUAL, SERVPERF, and HEdPERF instruments with HEISQUAL

4.2. Confirmatory factor analysis (CFA)

Although the factor loading provides substantial support to construct the scale, however, to make sure that the obtained factorial structure is stable, higher-order CFA was performed. According to Awang (2012), CFA is more constrained and allows researchers to assess the model fit. Amos 23 was used to perform CFA for the identified constructs.

To determine the goodness of fit of scales, Kaynak (2003) mentioned seven indicators, namely chi-square/degree of freedom (CMIN/DF), goodness of fit index (GFI), normative fit index (NFI), adjusted goodness of fit index (AGFI), comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). The chi-square to the degree of freedom (CMIN/DF) value for the proposed scale was 1.98, which fully complies with the R.P. Bagozzi and Yi (1988), RichardR Bagozzi and Yi (1988) and Byrne (1989) requirements of less than three and less than two, respectively. Moreover, all the other fit indices values (such as NFI = 0.922, CFI = 0.968, GFI = 0.948, AGFI = 0.907, and IFI = 0.946) were also found to be above 0.9 and fully complied with the ideal fit requirements of a group of researchers (Bentler & Bonett, 1980; McDonald & Marsh, 1990; R.P. Bagozzi & Yi, 1988; Byrne, 1989). The RMSEA value was 0.056 indicating a close-fit model and it meets Browne and Cudeck's (1992) cut-off requirement of up to 0.08. In addition to this, the SRMR value was 0.023, which was also well below the upper limit value 0.08 proposed by Hu and Bentler (Hu & Bentler, 1998) and indicated an adequate model fit (see Table A4 in Appendix A and Fig. 2). Based on these model fit indices values, it can be said that the model perfectly fits the data (R.P. Bagozzi & Yi, 1988; Browne & Cudeck, 1992).

Once the unidimensionality has been established, the reliability and internal consistency of the data should be calculated (Abdullah, 2006b). The reliability of the data was checked via Cronbach's alpha and was found to be 0.931, which fully complies with Peterson's (1994) lowest requirement of 0.8 and Lance, Butts, & Michels' (2006) 0.7 requirement. Moreover, the Cronbach's alpha value for the seven dimensions was 0.919 for teachers' profile, 0.886 for curriculum, 0.867 for infrastructure and facilities, 0.830 for management and support staff, 0.920 for employment quality, 0.826 for safety and security, and 0.917 for students' skills development. As all the values fully meet the required standards, it can be said that all the seven constructs possess internal consistency and are reliable.

After the establishment of unidimensionality and reliability, the next step is to ensure validity (Abdullah, 2006b; Hinkin, 1998). The construct validity was ensured via convergent validity (the degree to which the scale correlates with other scales assessing similar constructs) and discriminant validity (the degree to which the scale does not correlate with other scales assessing different constructs). The result of convergent validity showed that all the seven dimensions loaded more than 0.80 and the average variance extracted (AVE) values of all constructs was also higher than 0.5 (See Table A2 in the Appendix A). The discriminant validity was analysed using Fornell and Larcker (Fornell & Larcker, 1981) approach which states that the square root value of the construct should be higher than its correlation with other variables. The results given in the Table A5 in the Appendix A indicates that the square root of all constructs' AVE is higher than their correlation value; hence, it can be concluded that all variables possess required discrimination and there is no any issue of multicollinearity. By considering the results of EFA, CFA, unidimensionality of the scales, reliability, and validity, it can be said that the scale fully meets the benchmark requirements to propose the instrument.

5. Discussing the results

The present study aimed to investigate the factors which constitute SQ in HEIs and to develop an instrument that can be used to evaluate SQ specifically in HEIs. As students are the key stakeholders in HEIs, the researcher focused on their views and understanding of SQ and conducted interviews and focus group sessions with students from public and private HEIs located in Turkey. As per the findings, most of the students believe that the profile of the teachers, employment quality, infrastructure and facilities, management and support staff, curriculum, safety and security, and students' skills development activities are the major themes that dominantly symbolize the SQ of HEIs.

Teachers' profile includes their subject knowledge, communication skills, teaching style, and behaviour with students. Knowledge is an intangible and inimitable asset (Abbas & Sağsan, 2019) and in the present highly competitive business and job environment, teachers must have a comprehensive knowledge of their field. Teachers should not only have up-to-date knowledge of their academic subjects, but they should also be aware of changes taking place in the industry. Therefore, hiring individuals with a strong industry background, along with impressive academic qualifications can act as a strength for HEIs. If teachers explain academic concepts with real-life examples, this can significantly enhance students' knowledge and understanding. In their studies, Abdullah (2006b) and Brochado (2009) also mentioned teachers' knowledge as an important indicator of the academic institution's SQ. Students believe that teachers' subject knowledge has principal importance in their profile followed by communication skills, teaching style, and behaviour with students.

Teachers have maximum interaction with students. Their behaviour and communication skills can significantly impact on students' perception of SQ. Effective communication skills not only enable the teachers to explain the complex concepts easily and clearly but also enables the students to understand the concepts in the true spirit. Chong and Ahmed (2015) also emphasized that teachers should have effective command over the course language. They should be able to speak clearly and soundly. It is also essential that the instructors communicate with students in a polite and respectful style. They should show interest in understanding students' problems and make adequate efforts to help them in finding solutions. They also should motivate them to actively participate in class discussions. This act will instil confidence in students' academic as well as social life and will significantly enhance their satisfaction concerning the SQ of their HEI.

The infrastructure and facilities also have been identified as one of the leading indicators of SQ and relate to the findings of Galeeva (2016). The services offered by HEIs are customized and complex; therefore, they should ensure the availability of the highest quality infrastructure and facilities. This will not only enable the students to learn and perform efficiently but will also motivate their employees for excellent services. The present research divides infrastructure and facilities into three categories, namely learning facilities, supportive facilities, and cleanliness and maintenance. The HEIs should ensure that they provide adequate learning facilities to their students, such as adequate study space and well-managed library resources, such as books, newspapers, magazines. The management of HEIs should also make sure that they have access to different databases for research students. Moreover, the class environment, such as the number of students in the class, air conditioning, whiteboard, projector, internet and Wi-Fi facilities, also symbolize the SQ of HEIs. The students' experience of learning is supported by a number of supportive and maintenance facilities, such as transportation, cafeteria, and housing services. A well-maintained and clean classroom will enable the students to focus on their learning. Moreover, the availability of study material in the bookshops, the quality of food in cafeterias, maintenance, and pricing also impact on the students' experience of HEI's SQ.

Employment quality and safety and security are the two new indicators in the literature of SQ in HEIs. Many students expect that their institution not only should educate them according to the industry needs but also should help them in finding a quality job. One of the key reasons for students' concerns about their employment is that each year, thousands of students graduate from HEIs across the world and seek employment opportunities. However, because of the huge number of job candidates, employers have to be very selective when assessing candidates; hence, many students either remain unemployed or are underemployed. Considering the sensitivity of this issue, students' employability has also been declared as one of the four top priorities for national policy by the United Nations (UN, 2017). It is believed by students that employment support provided by HEIs could make the difference between ordinary and high-quality HEIs. As HEIs are responsible for educating their students according to industry needs, they should develop students' professional skills through their links with industrialists in the form of industry training, employment counselling, and job seminars. This could potentially strengthen the university's academic standing as well as increase the probability of students' employment. Most of the vibrant HEIs employ highly qualified and industry experienced individuals in their faculties. They not only prepare students according to the needs of managers but also facilitate the institutions in promoting their graduates' employability.

The previous two decades have seen the emergence of terrorism as one of the most critical global issues. Thousands of people across the world have lost their lives because of different terrorist attacks, with educational institutions not being exempt from this threat. This social disorder has resulted in a fear factor among students and their families. Students believe that HEIs should take adequate measures to ensure their safety and security within the campus. The security staff should be provided with the required training and equipment. Moreover, educational institutions along with local government should develop measures of security as this additional focus on security could potentially enhance the satisfaction of students and make them feel secure and confident. The management of HEIs should also ensure that emergency equipment, such as first aid and fire extinguishers, have been installed in easily accessible points so that, in an emergency, they can instantly be used.

SQ in HEIs is largely influenced by human interaction, especially in the form of teachers, management, and support staff. This finding relates to Teeroovengadum et al. (2016) study, which found that human interaction has a direct impact on students' experience of SQ. The management and support staff of HEIs should deal with students in an appropriate manner. The management should respect and value the students' views and suggestions in the form of feedback. They should take necessary actions to fulfil their justifiable requests. Issues related to administrative staff, such as the maintenance of accurate or up-to-date records and timely solution to students' problems can significantly reshape the students' experience of SQ with their institutions. Students also expect that the management of HEIs should ensure that administrative processes are clear in all departments and support staff has comprehensive knowledge of their job with effective communication skills.

It is also believed by the students that curriculum and students' skills developments activities are the other two important areas which significantly demonstrate the SQ of HEIs. Using an effective curriculum, teachers can develop students' intellectual skills. Students expect that the curriculum to be taught to them should be comprehensive, understandable, and make them think in creative ways. HEIs should design the

curricula by consulting with industry experts, as it will develop students' knowledge, skills, and abilities according to their potential employers. The students' skills development programs in the form of extra-curricular activities and personality development are also believed to be important indicators of SQ in HEIs and confirm Daud, Abidin, & Sapuan's (2011) study results. Education institutions, which provide adequate recreational and extra-curricular facilities to their students, enjoy greater reputation and goodwill. Dynamic institutions develop the personality of their students through their institutional environment. Through extra-curricular and recreational activities, HEIs can promote self-confidence, leadership, and emotional stability attributes in their students. For this purpose, clubs and societies within the HEIs can play a major role as they can empower and enhance responsibility within the students. This will not only enhance their confidence level but will also sharpen their decision-making skills.

Table A3 in the Appendix A compares HEISQUAL, the current study instrument, with other available instruments, such as SERVQUAL by Parasuraman et al. (1988), SERVPERF by Cronin and Taylor (1992), and HedPERF by Abdullah (2006b). HEISQUAL, the current study instrument, is different from other prevailing instruments in several ways. A principle difference between SERVQUAL, SERVPERF, and HEISQUAL is that both, SERVQUAL and SERVPERF have been designed from a general perspective, and are not for any specific "industry". To use them in a particular sector, one must modify them, which can result in discriminant validity, poor reliability, or variance restriction issues. HEISQUAL is specifically designed to measure SQ in HEIs. According to Abdullah (2006b), designing an instrument focusing on a specific industry eliminates the drawbacks associated with industry differences. Another difference between HEISQUAL and other instruments is the comprehensiveness of the instrument in the form of items and dimensions.

The items and dimensions of SERVQUAL, SERVPERF, and HedPERF cover the basic elements of quality and performance and fail to address the modern elements in the HEIs. On the other hand, by considering the social and technological changes that have occurred over the last two decades, HEISQUAL covers the basic as well as the advanced elements of quality in HEIs in a holistic manner. HEISQUAL includes traditional elements of SQ in HEIs, such as teachers' profile, infrastructure and facilities, extra-curricular activities, along with the modern dimensions, such as employment quality, safety and security, and personality development, which have not been operationalized in any previous research. Another point of difference is that the items of SERVQUAL, SERVPERF, and HedPERF only focus on operational elements, and ignores the technical aspects. Operational elements only focus on the process of designing and delivering products and services and do not pay adequate attention to the final results. Moreover, these instruments evaluate quality and performance from a general perspective. HEISQUAL is designed by focusing on students' perception of SQ in HEIs and includes items which not only focus on the processes but also the result, such as students' skills and personality development.

6. Conclusion

The present study follows a mixed-method technique to identify SQ dimensions in HEIs from the students' perspective and proposes a new scale which specifically measures SQ in HEIs by considering operational as well as technical elements. Qualitative data was collected through interviews and focus group sessions and was analysed through deductive reasoning using narrative and framework analysis with open coding. The analysis of interviews and focus group sessions extracted seven themes, specifically stated as teachers' profile, curriculum, infrastructure and facilities, management and support staff, employment quality, safety and security, and students' skills development. An instrument containing the seven major themes, sixteen sub-dimensions, and sixty-seven items (which was reduced to sixty-three during EFA) was developed by considering interviews, focus group sessions transcripts, and by benefiting from the literature. As all the statistical results have complied with scale development requirements, this study proposes a new instrument named HEISQUAL to measure SQ in HEIs.

Similar to other studies, the current study also has some limitations. For example, the current research follows a convenient sampling technique along with disproportionate age and field distribution. Besides, most of the responses were sourced from engineering (49 %) and business and management (36.7 %) faculties. The current research has a limited sample of 358 useable (437 overall received) responses. It is recommended to increase the sample size so that future studies can provide more robust analyses. Besides, the researcher collected data only from HEIs located in Turkey. These limitations provide the opportunity for future research which can be carried out by considering other stakeholders e.g. employers, government, and society etc., as HEIs must also satisfy their needs. Hence, the current study should be interpreted as a starting point for the construction and validation of a HEIs quality measuring instrument (HEISQUAL), particularly from students' perspective and the scientific community should proceed the work of this paper by effectively applying it to institutions in the form of case studies that are more robust in terms of data collection and sampling and provide the usefulness of the instrument on the influence of HEIs management and strategy. Moreover, it is also recommended that the same study is replicated in developed countries to further confirm the identified dimensions. Besides, the future studies should use SERVQUAL, SERVPERF and HEdPERF along with HEISQUAL for criterion-related validity evidence, especially for those dimensions that are overlapped.

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Declaration of Competing Interest

The author declares no conflict of interest.

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Appendix A

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Table A1
Demographic of respondents.

Particulars		Number	Percentage
Useable Responses	Female	142	39.7 %
	Male	207	57.82 %
	Prefer not to disclose	9	2.51 %
Age of Respondent	Less than 20	7	2 %
	20–25	190	53 %
	26–30	140	39 %
	31 or above	21	6 %
Status of Student	Full-time	326	91 %
	Part-time	32	9 %
Study Level	Bachelor	211	58.9 %
	Master	136	38 %
	PhD	11	3.1 %
Study Discipline	Engineering	176	49.16 %
	Management Sciences	131	36.7 %
	Other	51	14.3 %

Table A2
Results of EFA and Reliability Analysis.

Factors and sub-factors		Items	Factor loading	A
Teachers' profile	*Subject Knowledge*	My instructors have comprehensive knowledge of their field.	0.846	0.919
		The knowledge possessed by my instructors is up-to-date.	0.835	
		My instructors have adequate knowledge to answer students' questions	0.503	
		My instructors give real-life examples to enhance students' understanding	0.845	
	Communication Skills	The communication skills of my instructors are excellent	0.601	
		My instructors have effective command over the course language (English, Turkish etc.)	0.716	
		I can easily understand the concepts explained by my instructors	0.607	
		My instructors communicate in a polite and respectful manner	0.807	
	Teaching Style	My instructors explain the complex concepts in an easy and understandable manner	0.846	
		My instructors create an interactive environment in the class and engage students' interest	0.876	
		My instructors ensure active class participation of students	0.627	
		My instructors use different tools and techniques to enhance students' learning (learning games, class activities)	0.774	
	Behaviour with Students	My instructors demonstrate non-biased and non-discriminating behaviour	0.803	
		Instructors in my university instil confidence in students	0.664	
		My instructors show interest in understanding and solving students' problems	0.822	
		My instructors follow fair grading criteria	0.805	
		My instructors regularly give feedback to students on their academic performance	0.518	
Curriculum	Curriculum Quality	The curriculum taught at my university is comprehensive and easy to understand	0.841	0.886
		The curriculum taught at my university helps students to think in a creative and proactive way	0.907	
		The curriculum taught at my university improves students' intellectual abilities (decision making, problem-solving)	0.916	
		My university designs curricula by considering future job perspectives for students	0.787	
Infrastructure and Facilities	Learning Facilities	My university has adequate library resources (books, magazines, newspapers, study space, furniture, access to online databases)	0.664	0.867
		My university ensures availability of supportive tools and equipment for learning e.g. internet/ Wi-Fi, whiteboards, projector, air conditioner	0.703	
		The number of students per class is maintained at low to medium levels	0.784	
	Supportive Facilities	Lectures in my university are held as per the timetable and course content	0.665	
		My university provides satisfactory transportation, cafeteria, and bookshop services to students and staff members	0.525	
		My university provides adequate housing facilities to students and staff members	0.795	
		Prices and quality of goods and services in my university are reasonable	0.841	
	Cleanliness and Maintenance	My university has sufficient and well-maintained classrooms	0.874	
		The campus is kept neat and clean	0.867	
		My university campus and buildings are visually appealing and eye-catching	0.723	
Management and Support Staff	Behaviour with Students	Management and support staff of my university deal with students in an appropriate manner	0.962	0.83
		Management and support staff deal with all students fairly and equally	0.646	
		Management of my university gives value to students' feedback	0.466	
	Administrative Work	Admin and support staff of my university have effective communication skills	0.705	
		Admin and support staff of my university have comprehensive knowledge of their job	0.844	
		Admin and support staff of my university keep accurate and up-to-date records	0.716	
		Administrative processes at my university are clear and well structured	0.641	
		Admin and support staff (willing to) solve students' problem on time	0.962	
		The operating hours of my university are convenient for all	0.903	
Employment Quality	Links with Employers	My university has strong relations with the industry for its students' employment	0.847	0.92
		My university helps its graduates in finding jobs	0.802	
		My university regularly organizes different job and industry interaction events	0.842	
		My university has active job placement/work experience service for students	0.877	
	Employability Training	Different employability seminars are offered by my university to graduating students	0.830	
		The graduates of my university are highly employable and have high demand in the industry	0.786	
		My university has a good reputation in the industry based on their graduates' job performance	0.781	
Safety and Security	Security Measures	My university ensures high standards of safety and security on campus	0.924	0.826
		Security staff in my university are well trained and professional	0.984	
		Security staff is provided with suitable and modern equipment	0.963	
	Safety Equipment	My university has installed an adequate number of security cameras and metal detectors	0.86	
		My university has installed an adequate number of fire extinguishers	0.981	
		My university has an adequate number of first aid equipment	0.973	
		People within my university campus feel secure and confident	0.925	
Students' Skills Development	Extra-Curricular Activities	My university ensures adequate recreational and sports facilities	0.967	0.917
		My university provides financial and non-financial support for extra-curricular activities	0.844	
		My university organizes different extra-curricular activities on a regular basis	0.644	
	Personal Development	The atmosphere in my university instils leadership and active team player attributes in students	0.834	
		The atmosphere at my university develops students' soft skills (communication, critical and logical thinking, problem-solving)	0.881	
		My university environment develops self-confidence and emotional stability in students	0.868	
		The atmosphere in my university promotes acceptance and equality in students	0.859	
		My university environment develops the intellectual abilities of students (creativity, decision making, high-quality work)	0.841	
		My university environment promotes conscientiousness (taking responsibility, time management, organizing things) in students	0.787	

Table A3
Comparative analysis of SERVQUAL, SERVPERF, HEdPERF, and HEISQUAL.

Particulars	SERVQUAL by Parasuraman et al. (1988)	SERVPERF by Cronin and Taylor (1992)	HEdPERF by Abdullah (2006b)	HEISQUAL (The current study)
Industry	Address all industries in a general manner	Address all industries in a general manner	Items specifically focus on HEIs	Items specifically focus on HEIs
Instrument items and dimensions	The items and dimensions of the instrument cover basic elements of quality in the non-specific industry	The items and dimensions of the instrument cover basic elements of performance in the non-specific industry	The items and dimensions of the instrument cover basic elements of performance in HEIs	The items and dimensions of the instrument cover basic and advanced elements of quality in HEIs in a holistic manner by covering traditional and modern dimensions
Instrument focus	Includes operational elements (process) only and ignores technical elements (results)	Includes operational elements (process) only and ignores technical elements (results)	Includes operational elements (process)only and ignores technical elements (results)	Includes operational (process)as well as technical elements (results)
Measurement	Used to measure quality elements	Used to measure performance elements	Used to measure performance elements	The focus is on quality elements
Focus	Analyses quality from a general perspective	Analyses performance from a general perspective	Analyses performance from a general perspective	Analyses quality from students' perspectives

Table A4
Summary of the goodness of fit indices values.

Goodness of fit measures	CMIN/DF	NFI	GFI	AGFI	CFI	RMSEA	SRMR
Recommended value	≤3[a]	≥0.9[b]	≥0.9[2]	≥0.9 [b]	≥0.9 [b]	≤0.08[c]	≤0.80[d]
Present study values	1.98	0.922	0.928	0.907	0.948	0.056	0.023

[a] R.P. Bagozzi and Yi (1988), RichardR Bagozzi and Yi (1988).
[b] Bentler and Bonett (1980); Bollen (1986); McDonald and Marsh (1990); R.P. Bagozzi and Yi (1988), RichardR Bagozzi and Yi (1988); Byrne (1989).
[c] Browne and Cudeck (1992).
[d] Hu and Bentler (1998).

Table A5
Discriminant validity of SQ dimensions.

Dimension	Teachers' Profile	Curriculum	Infrastructure and Facilities	Management and Support Staff	Employment Quality	Safety and Security	Students Development
Teachers' Profile	***0.860***						
Curriculum	0.61	***0.864***					
Infrastructure and Facilities	0.52	0.53	***0.773***				
Management and Support Staff	0.50	0.66	0.64	***0.842***			
Employment	0.58	0.65	0.58	0.53	***0.836***		
Safety and Security	0.59	0.52	0.51	0.59	0.56	***0.863***	
Students Development	0.53	0.52	0.47	0.65	0.63	0.62	***0.869***

[1]The bold and italic values represent the square root of AVE.

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