

Developing a Comprehensive Higher Education Service Quality Model in Ethiopian Context

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Abstract

The existing literature lacks a comprehensive service quality model to measure higher education service quality, particularly from the Ethiopian higher education context. The main purpose of this study was to address this literature gap. To serve the study purpose, the existing generic service quality models mainly designed for market and higher education sectors were thoroughly reviewed. Through an extensive literature review, a comprehensive higher education service quality model was developed. The content validity and reliability of the instrument were empirically tested in three public universities representing 30% of universities located in the Southern part of Ethiopia. Five experienced experts who were selected from three different sample universities judged the content validation of the instrument. The experts' judgment in each item was quantitatively calculated using the Content Validity Index. The pilot study was conducted on 40 regular undergraduate students who were purposively selected from the different University departments to further analyze the reliability of the instrument while the internal consistency of the instrument was checked at Cronbach's alpha coefficient of 0.5 using Statistical Package for Social Sciences v.20. The findings of the study revealed that the newly developed model was valid and internally consistent. Since the present model is comprehensive and empirically tested in the Ethiopian higher education context, the model better measures the Ethiopian higher education service quality. However, further studies should be conducted using Exploratory Factor Analysis (EFA) to strengthen the present findings.

Keywords: *higher education service quality model, generic service quality models, quality assurance, quality education*

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1. Introduction

The Higher Education Institutions (HEIs) nowadays have been influenced by marketization. Different push factors affect HEIs to apply marketing practices in their institutions such as increased competition in higher education, decreased government funding, and the increased cost of education (Guilbault, 2016). For instance, the present government of Ethiopia is also designing different self-administration strategies and policies for public universities. In fact, in the 2023 academic year, Addis Ababa University (one of the oldest and largest universities in Ethiopia) has been officially differentiated as a self-administered university. The remaining first-generation public universities will be self-administered universities in the coming years. The self-administering system of universities is expected to increase competition among HEIs because universities that provide better services are expected to attract many students as compared with low service providers. In educational settings, there are various definitions for the term ‘educational service quality’ (Schneider & White, 2004); the most recent refers to the difference between students’ expectations and their actual perceptions of service delivery (Silva et al., 2017).

In today’s dynamic higher education sector, educational service quality is considered an important element to ensuring the quality of higher education. According to Onditi and Wechuli (2017), education service quality is a key determinant to measure the quality of higher education performance while Malik et al. (2010) pointed out that it is fundamental and an important parameter of educational excellence in general and higher education in particular. While the study of Raju and Bhaskar (2017) concluded that educational service quality is essential for a high standard of education and a good image of HEIs, Al-Dulaimi (2016) assert the need for universities to achieve objectives and promote the effectiveness of the education system. Hence, this study also contends that measuring higher education service quality is one of the key elements to ensure the quality in the institutions. The main purpose of this study was to develop a comprehensive Higher Education Service Quality Model [HESQM] to measure Ethiopian higher education service quality.

2. Background and Research Context

The HEIs across the world have been experiencing a quality assurance process (Hasbullah & Yosuff, 2017) that puts service quality as one of the most important elements in ensuring the quality of higher education (Đonlagić & Fazlić, 2015). In Ethiopia, the last fifteen

years saw rapid expansion of HEIs in different parts of the country (Kedir, 2009). The number of public universities increased from 2 in 1991 (Tesfaye, 2011) to 36 in 2015 (MoE, 2016). At present, there are 49 public universities and 128 accredited private HEIs in the country (Ministry of Education [MoE], 2018). The most recent data released by Ethiopian MoE (2018) show that the total number of undergraduate students who are attending their education in different Ethiopian public universities reached more than 825, 003 (520,177 males and 304, 826 females) in 2018.

The radical expansion of higher education in Ethiopia had mainly affected the quality of higher education in general and the provision of necessary educational services in particular. In recognizing these challenges, the government introduced various quality improvement initiatives and reform programs in higher education (Ayalew et al., 2009). Though different quality improvement initiatives and reform programs have been implemented to improve the quality of Ethiopian higher education, the recent empirical studies found that these initiatives and reform programs have brought a low impact on Ethiopian higher education quality (Alemayehu & Solomon, 2017; MoE, 2018). Therefore, designing a comprehensive higher education service quality model from the Ethiopian higher education context is imperative to (1) measure the quality of higher education, (2) take appropriate measures to improve the quality of Ethiopian higher education and (3) identify areas that need further attention.

3. Literature Review

3.1. Existing Service Quality Models

The higher education service quality measures are still underdeveloped because their measurements are almost adopted from models designed for business sectors (Marimuthu & Ismail, 2012). In the literature, many prior studies have employed generic service quality measures, especially Service Quality (SERVQUAL) and Service Performance (SERPERF) models to examine higher education quality (Tuan, 2017; Wei & Ramalu, 2011; Manea & Iatagan, 2015; Mwiya et al., 2017). Among the generic service quality models, SERVQUAL is the most popular service quality measure. The modified SERVQUAL model, which describes the difference between customer expectations about the service provided and their perception after taking the service, consists of five dimensions; tangibles, reliability, responsiveness, assurance and empathy and includes a total of 22 items (Parasuraman et al., 1985) (see appendix table A1).

Although SERVQUAL is well-known model in business and higher education sectors, the SERVQUAL model is not free from scholarly critics. According to Cronin and Taylor (1992), customer's expectations before experiencing the service is difficult to conceptualize. They further claim that there is little evidence, either theoretical or empirical, to support the notion of the “expectations minus performance” gap as a basis for measuring service quality. This situation led Cronin and Taylor (1992) to look for another alternative model. Cronin and Taylor (1992) modified the SERVQUAL model and proposed another model called Service Performance [SEVPERF] that measures performance only. The five SERPERF model dimensions are worded the same as SERVQUAL but do not repeat the set of statements as expectation items. Because of the complex nature of higher education service quality, many higher education service quality researchers (e.g., Abdullah, 2006a; Annamdevula & Bellamkonda, 2012) argue against employing generic service quality models in the higher education sector.

Research on service quality in higher education settings has generally revolved around major two issues: (1) measurement method and (2) dimensions or facets of higher education service quality (Yildiz, 2012; Kontic, 2014). The nature of higher education services is composed of multi-dimensional constructs or variables. As a result, different scholars propose different models to measure higher education service quality (Cerri, 2012). For example, Abdullah (2006a) argues that the use of existing marketing sector service quality models may not be applicable in all service sectors, particularly higher education and proposes a new measure of higher education service quality called Higher Education Performance [HEdPERF]. As an adopted model from Cronin and Taylor (1992) performance-only or Service Performance [SEVPERF] approach, the HEdPERF model has six dimensions, namely, non-academic aspects, academic aspects, reputation, access, program issues and understanding. In his later work, Abdullah (2006b) modified the existing HEdPERF instrument by comparing three service quality measurements, such as HEdPERF, SERVPERF and the moderating scale of HEdPERF-SERVPERF within a higher education setting. In the modified HEdPERF instrument, Abdullah (2006b) indicated five distinct factors, namely, non-academic aspects, academic aspects, reputation, access and programme issues by excluding understanding from the former HEdPERF instrument. The modified HEdPERF consists of 41 items; 13 items were taken from SERVPERF, and the remaining 28 items were developed via literature review (see appendix table A2).

Researchers like Annamdevula and Bellamkonda (2012) developed another new higher education service quality measure called the Higher Education Quality [HiEdQUAL] model. Annamdevula and Bellamkonda (2012) also contend that since higher education services are a complex combination of various factors, using the existing generic service quality measures such as SERVQUAL, SERPERF and Evaluated Performance (EP) is not easy to apply in higher education sectors. Therefore, they introduced Higher Education Quality [HiEdQUAL] model which consists of 27 items, with five dimensions, viz., teaching and course content, administrative services, academic facilities, campus infrastructure and support services (see appendix table A3).

Other higher education service quality researchers like Teeroovengadam et al. (2016) argue that although the existing higher education service quality models are empirically tested in higher education, none of them integrated the notion of transformative quality in the development of service quality models. Teeroovengadam, et al. (2016) introduced the new higher education service quality measure called Higher Education Quality [HESQUAL], which consists of five primary dimensions and nine-sub dimensions such as administrative quality (attitude and behavior, administrative processes), support facilities quality, core educational quality (curriculum, attitude and behavior, competence and pedagogy), transformative quality and physical environment quality (support infrastructure, learning setting and general infrastructure) and included a total of 48 items (see appendix table A4 & A5).

3.2. Limitations of the existing service quality models and rationale

The literature review shows that both generic service quality models designed for business sectors as well as service quality models principally developed for the higher education sector have attempted to measure higher education service quality. However, this paper argues that using a single model either a generic service quality model or a service quality model mainly designed to measure higher education, is not comprehensive and responsive enough to measure Ethiopian higher education service quality context. Each generic as well as higher education service quality model consists of too short dimensions and items or constructs that do not include all basic services provided by Ethiopian universities. It is a fact that, Ethiopian higher education does not work in isolation; however, in some existing higher education service quality models; many services that have been provided in Ethiopian higher education are missing. For example, Ethiopian higher

education provides free dormitory and cafeteria services for undergraduate regular students and in some universities including postgraduate students. Free dormitory and cafeteria services are not common services in most countries. In addition, the literature lacks study that developed a comprehensive model from the Ethiopian higher education context. Table 1 and Table 2 shortly summarise the strengths and weaknesses of the existing generic service quality models and models designed for higher education service quality.

Table 1

Strengths and weaknesses of existing generic service quality models

Models	SERVQUAL	SERVPERF
Author(s)/Year	Parasuraman, et al. (1985)	Cronin and Taylor (1992)
Number of Dimensions	Five dimensions	Five dimensions
Number of items	22	22
Sectors applied	Commercial and Higher Education	Commercial and Higher Education
Strengths	The most popular service quality measure Widely used service quality measure	Well known service quality measure Measures service quality from performance only perspective
Weaknesses	Not empirically tested in higher education Constructs are not comprehensive enough to measure all dimensions of higher education service quality	Not empirically tested in higher education Constructs are not comprehensive to measure all dimensions of higher education service quality

Source: Authors own work; where; SERVQUAL=Service Quality; SERPERF=Service Performance

Table 2

Strengths and weaknesses of existing higher education service quality [HESQ] models

Existing HESQ Models	HEdPERF	HiEdQUAL	HESQUAL
Author(s)/Year	Abdullah (2006)	Annamdevula and Bellamkonda (2012)	Teeroovengadu et al. (2016)
Number of Dimensions	Five dimensions	Five dimensions	Five major and nine sub-dimensions
Number of items	41	27	48
Sectors applied	HEIs	HEIs	HEIs
Strengths	Empirically tested in higher education sectors	Empirically tested in higher education sectors	Empirically tested in higher education sectors
Weaknesses	Constructs are not comprehensive to measure all dimensions of higher education service quality	Constructs are not comprehensive to measure all dimensions of higher education service quality	Constructs are not comprehensive to measure all dimensions of higher education service quality

Source: Authors own work; where; HEdPERF=Higher Education Performance; HiEdQUAL=Higher Education Quality; HESQUAL=Higher Education Service Quality; HEIs=Higher Education Institutions

3.3. Conceptual framework

The existing literature lacks a comprehensive service quality model that measures higher education service quality, particularly from the Ethiopian higher education context. In this study, a combination of the existing generic service quality models mainly designed for business sectors, such as SERVQUAL, SERVPERF and models particularly designed for higher education, namely, HEdPERF, HiEdQUAL, HESQ were thoroughly reviewed and adapted to develop the comprehensive model. In the newly developed HESQM, seven major dimensions and nine sub-dimensions were identified. The major and sub-dimensions include academic service quality (academic staff's attitude and behavior, academic staff's competence, academic facilities and resources, academic program issues, quality of instructional practices, quality of library services), administrative services (administrative staffs' attitude and behavior, quality of administrative processes and procedures, administrative staffs' competence), quality of general infrastructure, quality of support services and facilities, quality of students' welfare services, university access to students and university reputation (see appendix tables A6-A10).

4. Research Methodology

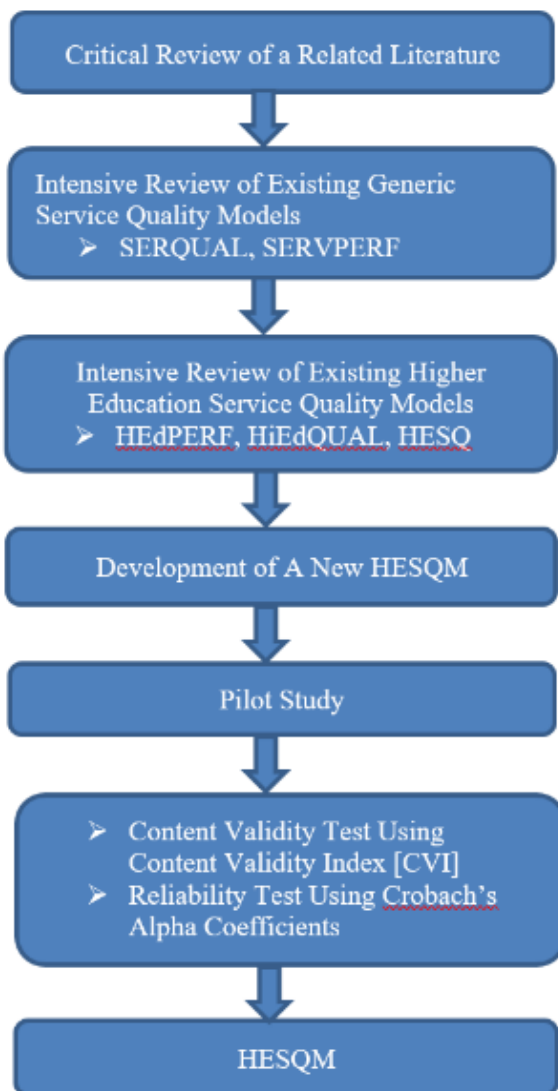
4.1. Method

This study intensively reviewed research documents that are relevant to the research objectives through different web searches. The main web searches employed in the review mainly include the University online library and Google Scholar. Through the University online library, researchers accessed pertinent research materials from well-known databases such as science direct Elsevier, EBSCO, Project Muse, Springer Link, SAGE Journals and the Francis and Taylor Group. In the review, except for very few publications, the most recent studies (published between 2005 and 2022) were thoroughly reviewed totaling 90 peer-reviewed past studies focused on higher education service quality. Through an extensive literature review, a comprehensive Higher Education Service Quality Model [HESQM] model was developed intended to measure Ethiopian higher education service quality. The content validity of the questionnaire was conducted to check whether the designed items measure or represent the intended study objective or content area and it is mainly carried out by experts (Creswell, 2012). Furthermore, the reliability of the questionnaire was

also checked to ensure the internal consistency of the instruments. Figure 1 summarises the development of a new higher education service quality model.

Figure 1

Summary of the development of HESQM



Source: Authors own work

4.2. Sample

The researchers conducted content validation and a pilot study in Ethiopian public universities located in the Southern part of Ethiopia because of access study subjects and data collection. From the total of ten public universities in the Southern part of Ethiopia, 3 (30%) universities were randomly selected from three differentiations such as research, applied

and comprehensive universities. Among the universities, Hawassa University as research university and Wolaita Sodo University and Jinka University as applied and comprehensive universities, respectively were included in the present study. This study assumed that the educational service quality data collected from research, applied and comprehensive universities are representative enough to empirically test the validity and reliability of the new model. For this study, experts from different sample universities and fields of the study were purposively selected to check the content validity of the instrument. The experts were chosen based on their teaching experiences in HEIs, research experiences and well-informed knowledge of the discipline of educational planning and management, curriculum and instruction, educational research, and educational measurement and evaluation. Table 3 summarises the profile of content validity evaluators.

Table 3

Content validity evaluators' profile

Content Validity Evaluator	University	Teaching Experience in HEI (in years)	Highest Academic Qualification	Field of Study	Academic Rank	Current Position
1	HU	19 years	PhD	Educational Policy and Leadership	Associate Professor	Dean, College of Education and Behavioral Studies
2	HU	31 Years	PhD	Educational Policy and Leadership	Assistant Professor	Assistant Professor of Educational Planning and Management
3	HU	17 Years	MA	Curriculum and Instruction, Special Need and Inclusive Education	Associate Professor	Institutional Quality Assurance Coordinator
4	WSU	7 years	PhD	Educational Policy and Leadership	Associate Professor	Head, Department of Educational Planning and Management
5	JKU	8 years	MA	Psychology	Lecturer	Teacher

Source: Authors own work where; CVE=Content Validity Evaluator; HEIs=Higher Education Institutions; HU=Hawassa University; WSU=Wolaita Sodo; University; JKU=Jinka University

4.3. Qualitative results of instruments content validation

The oral discussion with the instruments' content validity evaluators generated comments to further improve the quality of the tool. The main comments include length of the directions, language clarity, repetition of items, items that are not reflecting main and subtitles, proposing new items to be added, consistency and order of items, unnecessary use of conjunctions and length of the directions. After considering the comments, the researchers thoroughly re-read all items and identified some potential errors. The consistency and order of items, language clarity problems, and unnecessary use of conjunctions in items and length of the directions were corrected. Three new items that pertain to students with disability services were also constructed and added under the general campus infrastructure dimension.

5.3 Quantitative analysis of instruments content validity

On top of the inputs received via oral discussion with content validity evaluators, the content validity of the questionnaire was also statistically checked. The five content validity evaluators selected from three sample universities rated the relevance of each educational service quality item. The content validity was calculated using the Content Validity Index [CVI]. The acceptance rate of content validity rate varies according to the number of content validity evaluators involved. For example, if two experts are involved, the acceptable value of CVI is 0.80, whereas total number of nine experts, the acceptable value is 0.78. Table 4 summarises scholars' recommendations about to the acceptance range of the content validity index of the items.

Table 4

Summary of Rule of Thumb of Content Validity Index [CVI]

Number of experts who evaluated the content validity of the tool	Acceptable content validity index values	Author (s)
Two experts	At least 0.80	Davis, 1992
Three to five experts	Should be 1	Denise et al., 2007
At least six experts	At least 0.83	Denise et al., 2007
Six to eight experts	At least 0.83	Lynn, 1986
At least nine experts	At least 0.78	Lynn, 1986

Source: Authors own work

5.4. Calculating content validity index

The content validity index can be measured in two ways: (1) Item Level Content Validity Index [I-CVI] and (2) Scale-Level Content Validity Index [S-CVI]. The I-CVI can be mathematically calculated as the number of experts' agreements in each item divided by the total number of expert raters. For example, the first item, 'My Lecturers/Professors have a positive attitude towards students', all five content validity assessors ranked as 4=Highly Relevant [HR]. Thus, the I-CVI of this item was calculated as $5 \div 5 = 1$.

Table 5

Content validity index of education service quality questionnaire

Items	Experts in Agt.	I-CVI	Items	Experts in Agt.	I-CVI	Items	Experts in Agt.	I-CVI	Items	Experts in Agt.	I-CVI
1	5	1	35	2	0.4	69	5	1	103	5	1
2	5	1	36	5	1	70	5	1	104	5	1
3	5	1	37	5	1	71	5	1	105	5	1
4	5	1	38	5	1	72	5	1	106	5	1
5	5	1	39	2	0.4	73	5	1	107	5	1
6	5	1	40	5	1	74	5	1	108	5	1
7	5	1	41	5	1	75	2	0.4	109	5	1
8	5	1	42	5	1	76	5	1	110	5	1
9	5	1	43	2	0.4	77	5	1	111	5	1
10	5	1	44	5	1	78	5	1	112	5	1
11	5	1	45	5	1	79	5	1	113	5	1
12	5	1	46	5	1	80	2	0.4	114	5	1
13	5	1	47	5	1	81	2	0.4	115	5	1
14	2	0.4	48	5	1	82	5	1	116	5	1
15	5	1	49	5	1	83	5	1	117	5	1
16	5	1	50	5	1	84	5	1	118	5	1
17	5	1	51	5	1	85	5	1	119	5	1
18	2	0.4	52	5	1	86	5	1	120	5	1
19	5	1	53	5	1	87	5	1	121	5	1
20	5	1	54	5	1	88	5	1	122	5	1
21	5	1	55	5	1	89	5	1	123	5	1
22	5	1	56	5	1	90	5	1	124	5	1
23	5	1	57	5	1	91	5	1	125	5	1
24	5	1	58	5	1	92	5	1	126	5	1
25	5	1	59	5	1	93	5	1	127	5	1
26	5	1	60	5	1	94	5	1	128	5	1
27	5	1	61	5	1	95	5	1	129	5	1
28	5	1	62	5	1	96	5	1	130	5	1
29	5	1	63	5	1	97	5	1	131	5	1
30	5	1	64	5	1	98	5	1	132	5	1
31	2	0.4	65	2	0.4	99	5	1	133	5	1
32	5	1	66	5	1	100	5	1	134	5	1
33	5	1	67	5	1	101	5	1	135	5	1
34	1	1	68	5	1	102	5	1	136	5	1
Total Relevant= 126			Proportional Relevant [S-CVI/Ave]= $126 \div 126 = 1.07$								

Source: Authors own work; *Note:* I-CVI=Item Level Content Validity Index; S-CVI/Ave=Scale Level Content Validity Index; Agt. =Agreement

As presented in table 5, the result of CVI was evaluated according to Denise et al. (2007). If three to five experts are involved in the content validation of the questionnaire, the acceptable values of CVI should be 1. On the other hand, S-CVI is calculated by adding each acceptable I-CVI result or total relevant divided by the total number of items. In this study, items yielded acceptable (1) I-CVI were included to calculate the S-CVI and items which scored 1 I-CVI were retained and items which scored 0.4 I-CVI were deleted from the questionnaire.

5.5 Quantitative results of instruments content validation

A total of 136 items intended to measure education service quality were administered to content validity evaluators. As shown in table 5, I-CVI was computed for each item with 126 items yielding I-CVI (1) acceptable value 1 according to Denise et al. (2007) rule of thumb while 11 items that yielded a low I-CVI (0.4) were deleted from the questionnaire. After making intensive revisions on each item, a total of 126 items were retained. In addition, based on the written comments forwarded by content validity evaluators, the other three new items that reflect students with disability services were added under the quality of general infrastructure subsection. Therefore, a total of 129 items intended to measure Ethiopian Higher Education Service Quality were ready for pilot testing. Table 6 summarises the item's revision based on I-CVI result.

Table 6

Summary of items revision

Items	I-CVI Result	Potential Errors Identified Based on I-CVI Result	Actions Taken
Q14	0.4	Repeated in the same subtitle	Deleted
Q18	0.4	Repeated in the same subtitle	Deleted
Q31	0.4	Doesn't reflect the subtitle	Deleted
Q35	0.4	Doesn't reflect the subtitle	Deleted
Q39	0.4	Repeated in the same subtitle	Deleted
Q43	0.4	Doesn't reflect the subtitle	Deleted
Q65	0.4	Doesn't reflect the subtitle	Deleted
Q75	0.4	Repeated in the same subtitle	Deleted
Q80	0.4	Repeatedly asked under subtitle	Deleted
Q81	0.4	Doesn't reflect the subtitle	Deleted

Source: Authors own work; where; Q=Question; I-CVI=Item Level Content Validity Index

5.6. Pilot study

Upon the completion of the instruments' content validation, the reliability of the questionnaire was checked. A pilot study was conducted at Hawassa University. There is no consistent number of participants for the pilot study; different scholars suggest a different number of participants for the pilot study. For example, Gay and Mills (2012) and Johnson and Christensen (2014) suggest a minimum of 5 to 10 groups of people for piloting the instrument while Saunders (2009) argues that the number of people with whom to pilot depends on the research question(s), the size of the research project, the time and money resources available, and how questionnaire was initially designed. Considering these arguments, the pilot study was conducted to forty (40) regular undergraduate students at Hawassa University; 25 males and 15 females. The participants for the pilot study were purposefully selected from different departments. The researchers with the research assistants properly disseminated the questionnaire to the volunteer participants with a brief orientation about the purpose of the study and the process of filling out the questionnaire. Since the questionnaire sections were somewhat lengthy, one-week period was given to the participants to return the questionnaire. All the participants filled out and returned the questionnaire.

The questionnaire in English with a brief introduction and instructions has two parts. The first part contains respondents' demographic information and general directions on how to fill out the questionnaire. The second part includes items about the measurement of educational service quality.

5.7. Reliability Analysis

The reliability of each main dimension and sub-dimension were checked. The reliability result was assessed according to George and Mallery's (2003) rule of digits: > 0.90 = Excellent; $0.80 - 0.89$ = Good; $0.70 - 0.79$ = Acceptable; $0.60 - 0.69$ = Questionable; $0.50 - 0.59$ = Poor; < 0.50 = Unacceptable. As summarized in table 7, the reliability results indicate that the majority of the facets of education service quality yielded an acceptable alpha value, except for thirteen items that explain the attributes of educational service quality. After making all these corrections, a total of one hundred sixteen (116) items were retained. Table 6 summarises the reliability result of the questionnaire.

Table 7

Reliability results of education service quality questionnaire (N=40)

Higher Education Service Quality Facets/Dimensions	No. of Items	Deleted Items	Cronbach's \Alpha Result	Leveled as George & Mallery (2003)
Main Facet-1: Academic Service Quality				
Sub-Dimensions				
Academic Staff's Attitude and Behavior	12	2	.812	Good
Academic Staffs' Competence	9	-	.800	Good
Academic Facilities and Resources	12	-	.922	Excellent
Academic Program Issues	7	2	.835	Good
Quality of Instructional Practices	18	-	.915	Excellent
Quality of Library Services	9	2	.848	Good
Sub Total	67		.952	Excellent
Main Facet-2: Administrative Service Quality				
Sub-Dimensions				
Administrative Staff's Attitude and Behavior	10	1	.912	Excellent
Quality of Admin. Processes and Procedures	3	-	.869	Good
Administrative Staffs' Competence	5	-	.833	Good
Sub Total	18		.918	Excellent
Main Facet -3: Quality of General Infrastructure	11	1	.917	Excellent
Main Facet-4: Quality of Support Services and Facilities	12	-	.915	Excellent
2Main Facet- 5: Quality of Students' Welfare Services	7	2	.786	Acceptable
Main Facet- 6: University Access to Students	7	2	.847	Good
Main Facet: 7: University Reputation	7	1	.914	Excellent
Sub Total	44			
Grand Total	129			
Full Scale	116		.915	Excellent

Source: Authors own work

6. Summary of Major Findings and Discussion

In the previous studies, many international and local researchers have used a single service quality model to measure higher education service quality. Among the local studies, Solomon (2012) employed the SERVQUAL Model to examine stakeholders' perception of Ethiopian higher education service quality while Gelilawit (2019) employed SERPERF to examine the effect of service quality on students' satisfaction. Furthermore, Semira (2019) and Girum (2017) used HEdPERF to investigate the effect of service quality on students' satisfaction. Since higher education service quality is composed of multi-dimensional constructs, using a single model cannot fully measure the complex nature

of Ethiopian higher education service quality. Consequently, in the present study, a comprehensive Higher Education Service Quality Model [HESQM] was developed to measure Ethiopian higher education service quality. Through an extensive literature review, seven main and nine sub-dimensions of higher education service quality and included a total of 136 items were identified.

The newly developed HESQM was empirically tested in Ethiopian higher education through the purposefully selected experts from the fields of educational planning and management, curriculum and instruction, and psychology, have evaluated the content validity of the instrument. Furthermore, the reliability of the instrument was also analyzed to further check the internal consistency of the instrument. In any research, ensuring the validity and reliability of the instrument is an important procedure as a valid instrument measures what the questionnaire is supposed to measure and reliable instruments are internally consistent (Ghazali, 2016). Based on the test results of content validity and reliability, constructs that do not meet the intended objectives of the study were removed from the questionnaire. After making all necessary corrections on the questionnaire, a comprehensive HESQM consisting a total of 116 items was retained. Since using a single model is unable to fully explain the Ethiopian higher education service quality, the newly developed comprehensive HESQM model is better at explaining educational service quality from the Ethiopian higher education context.

7. Conclusion and Recommendations

The results of the study confirmed that the newly developed comprehensive HESQM instrument was valid and internally consistent. The findings of the present study further assured that HESQM is a comprehensive model to measure Ethiopian higher education service quality. Because the present model is comprehensive and empirically tested in the Ethiopian higher education context, the model better measures the Ethiopian higher education service quality. Thus, future researchers may use the newly developed compressive HESQM to conduct research that is associated with Ethiopian higher education service quality and quality assurance and service quality. The Ethiopian higher education quality assurance agencies administrators, educational policy and decision makers and experts can incorporate additional service quality dimensions that have not been touched in their higher education

quality assurance yardsticks. Furthermore, each Ethiopian HIE has ‘Institutional Quality Enhancement Directorate Director’. This office follows up on the educational quality of their respective institutions. Hence, the present study provides significant information to institutional quality assurance experts who evaluate the institutional quality of education in providing a comprehensive model to evaluate the educational quality of the institution.

8. Implications

8.1. Practical implications

The present HESQM is a comprehensive model to measure Ethiopian higher education service quality. Since using a single model is unable to fully explain the Ethiopian higher education service quality, the new comprehensive model is better at explaining Ethiopian higher education service quality.

8.2. Social implications

The existing literature lacks a comprehensive service quality model to measure higher education service quality, particularly from the Ethiopian higher education context, the place of current research. Measuring higher educational service quality is one of the most important elements to ensure the quality of higher education. The findings of the present research provide valuable insights to HEI management bodies, higher quality assurance agencies and Ministry of Education to learn a comprehensive model that better measures higher education service quality. Thus, the present may help the practitioners who measure higher education service quality by providing a comprehensive model.

8.3. Implications for Future Research

In this study, quantitative research approach was employed. Further comparable studies should conduct a mixed research approach to better determine the present findings. In addition, future studies should be conducted using Exploratory Factor Analysis [EFA] to strengthen the present findings though the new HESQM model’s content validity and reliability have been empirically tested in Ethiopian higher education. In general, the higher education service quality is a combination of various factors or variables. Therefore, this study also encourages future researchers to still re-look at other known models such as Total Quality Management [TQM], Service Driven Market Orientation [SERVMO], and

Higher Education Total Quality Management of Excellence [HETQM], to further incorporate missing constructs in the present Higher Education Service Quality Model [HESQM].

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Appendices

Table A1

Summary of service quality model adapted to higher education

Author (s)	Dimensions	Constructs or Variables	Dimensions	Constructs or Variables
Parasuraman, et al. (1988)	Tangibles	<ol style="list-style-type: none"> 1. Neat staff appearance 2. Adequate library facilities 3. Comfortable lecture rooms 4. Access to the internet 	Assurance	<ol style="list-style-type: none"> 1. High-quality service standards 2. High-quality administrative services 3. High-quality academic services 4. Teachers are friendly 5. Teachers are efficient in research
	Reliability	<ol style="list-style-type: none"> 1. High ability and knowledge provided by staff and lecturers 2. Non-discriminatory treatments provided by staff and lecturers 3. Appropriate academic services provided by the university 4. Registration is timely and error-free 	Empathy	<ol style="list-style-type: none"> 1. Serving students friendly 2. Provides information that is easy to understand 3. University administration has student-based interest 4. The Computer facility for students is sufficient 5. Study rooms are available for students
	Responsiveness	<ol style="list-style-type: none"> 1. Availability of personnel to assist you 2. Fast response 3. Accurate academic services 4. Quickly complain handlings 		

Source: Authors own work

Note: Total Dimensions of SERQUAL:5; No. of Items: 22

The 5 dimensions of Service Performance [SERPERF] Model is worded the same as SERVQUAL, but do not repeat the set of statements as expectation items.

Table A2*Summary of modified higher education performance model*

Author(s)	Dimensions	Constructs or Variables	Dimensions	Constructs or Variables
Abdullah (2006b)	Non-academic aspects	<ol style="list-style-type: none"> 1. Positive attitude towards the students 2. Provides caring and individualized attention 3. Efficient in dealing with students' complaints 4. Interest in solving students' problems 5. Knowledgeable of systems/procedures 6. Provides service within reasonable time 7. Maintains accurate records of their students 8. Has convenient opening hours 9. Guarantees confidentiality of information. 10. Good communication with students 11. Students feel secured and confident 	Reputations	<ol style="list-style-type: none"> 1. Campus facilities 2. Minimal class sizes 3. Ideal campus layout. 4. Employable graduates. 5. Students are given a fair amount of freedom. 6. Adequate health services 7. Reputable Academic Program
	Academic aspects	<ol style="list-style-type: none"> 1. Provides efficient and courteous consultations 2. Interest in students' requests for assistance 3. Feedback on their progress options 4. Adequate equipment 5. Academic facilities 6. Knowledgeable in course content. 7. Positive attitude towards students. 8. Caring and courteous towards students 9. Good communication skills. 10. Interest in solving students' problems 11. Educated and experienced 	Program Issues	<ol style="list-style-type: none"> 1. Satisfactory syllabus 2. Provides various types of courses 3. Displays professional image 4. Provides flexible syllabus and structure 5. Provides safe and reliable services 6. Provides reputable academic programs
	Access	<ol style="list-style-type: none"> 1. Supports students 'associations 2. Values and recognizes students' feedback 3. Simple service delivery procedures 4. Ensures excellent counseling services 5. Provides equal treatment and respect 6. Easily contacted 		

Source: Authors own work; *Note:* Total Dimensions of HEdPERF: 5; No. of constructs: 41

Table A3*Summary of higher education quality model*

Author (s)	Dimensions	Constructs or Variables	Dimensions	Constructs or Variables
Annamdevula and Bellamkonda (2012)	Teaching and Course Content	<ol style="list-style-type: none"> 1. Teachers' responsive and Accessible 2. Teachers follow the Curriculum strictly 3. Teachers follow good Teaching Practices 4. Relevance b/w Program & Syllabus 5. Courses develop students' knowledge 6. Informs schedules, exams, results 7. Teachers Complete Syllabus on time 8. The department has Sufficient Academic Staff 	Campus Infrastructure	<ol style="list-style-type: none"> 1. Adequate hostel facilities 2. Adequate medical facilities 3. Adequate Amenities 4. Campus infrastructure is well maintained
	Administrative Services	<ol style="list-style-type: none"> 1. Provide Service without delay 2. courteous and willing to help 3. Provide Error free work 4. maintains accurate and retrieval Records 5. Accessible during office hours 6. The university has safety and security measures 	Support Services	<ol style="list-style-type: none"> 1. Sufficient sports and recreation facilities 2. Provides placement services 3. Provides counseling services
	Academic Facilities	<ol style="list-style-type: none"> 1. The department has adequate facilities 2. Classrooms equipped with teaching aids 3. The department has sufficient class rooms 4. The university has adequate auditoriums, 5. The library has adequate academic resources 6. Computer labs have adequate equipment and internet facilities 		

Source: Authors own work*Note:* Total Dimensions of HiEdQUAL: 5; No. of Items: 27

Table A4*Summary of higher education service quality model*

Author (s)	Main Dimensions	Sub-dimensions	Constructs or Variables
Teeroovengadam, et al. (2016)	Administrative Quality	Attitude and Behavior	<ol style="list-style-type: none"> 1. Willingness to help students 2. Ability to solve students' problems 3. Politeness of administrative staff 4. Imparts confidence in students
		Administrative Process	<ol style="list-style-type: none"> 1. There is not much bureaucracy 2. Service delivery times are minimum 3. Transparency of official procedures and regulations
	Physical Environment Quality	Support Infrastructure	<ol style="list-style-type: none"> 1. Adequate cafeteria infrastructure 2. Adequate library infrastructure 3. Adequate recreational infrastructure 4. Adequate sports infrastructure
		Learning Setting	<ol style="list-style-type: none"> 1. Having adequate lecture rooms 2. Having quiet places to study within the campus 3. Availability of adequate teaching tools and equipment
		General Infrastructure	<p>Favorable ambient conditions Appearance of buildings and grounds</p>
	Core Educational Quality	Attitude and Behavior	<ol style="list-style-type: none"> 1. Lecturers understanding students' needs 2. Lectures giving personal attention to students 3. Availability of lecturers to guide and advise students 4. Prevalence of a culture of sharing and collaboration among lecturers 5. Behavior of lecturers instilling confidence in students 6. Lecturers appearing to have students' best interest at heart

Source: Authors own work

Table A5*Summary of higher education service quality model*

Author (s)	Main Dimensions	Sub-dimensions	Constructs or Variables
Teeroovengadam, et al. (2016)	Core Educational Quality Continued	Curriculum	<ol style="list-style-type: none"> 1. Clearly defined course content and course objectives 2. Usefulness of module content and design 3. Challenging academic standards of program 4. Relevance of course content
		Pedagogy	<ol style="list-style-type: none"> 1. Use of multimedia in teaching 2. Active participation of students in their learning process 3. Provision of regular feedback to students 4. Well-designed examinations and continuous assignment
		Competence	<ol style="list-style-type: none"> 1. Theoretical knowledge, qualifications and practical knowledge of lecturers 2. Communication skills of lecturers 3. Lecturers are up-to-date in their area of expertise
	Support Facilities Quality	-	<ol style="list-style-type: none"> 1. Reasonable pricing on campus 2. Availability of adequate IT facilities 3. Availability and adequacy of photocopy facilities 4. Availability of transport facilities 5. Amount of opportunity for sports facilities 6. Availability and adequacy of extracurricular activities
	Transformative Quality	-	<ol style="list-style-type: none"> 1. Enabling students to be emotionally stable 2. Increase in self-confidence of students 3. Development in students' critical thinking 4. Increase in self-awareness of students 5. Development of problem-solving skills 6. Enabling students to transcend their prejudices 7. Acquiring adequate knowledge and skills 8. Increase in knowledge, abilities and skills of students

Source: Authors own work*Note:* Total Main Dimensions of HESQUAL: 5; Total Sub-dimensions of HESQUAL: 9 No. of Items: 48

Table A6*Summary of comprehensive higher education service quality measure model*

Author (s)	Main Dimensions	Sub-dimensions	Constructs or Variables
Oliso, et al.(2023)	Academic Service Quality	Academic Staffs' Attitude and Behavior	<ol style="list-style-type: none"> 1. Have a positive attitude toward students 2. Understand the individual needs of their students 3. Show sincere interest in solving students' problems 4. Welcome students' questions and comments 5. Provide efficient and courteous consultations to students 6. Provide students with feedback on their progress options 7. Provide the students with the expected knowledge 8. Willing to go out of his or her way to help students 9. Encourage and motivate students to do their best 10. Fair and impartial in grading
		Academic Staffs' Competence	<ol style="list-style-type: none"> 1. Have both theoretical and practical knowledge 2. Highly educated & knowledgeable in their areas of specialization 3. Prominent researchers 4. Have excellent communication skills 5. Use the latest technologies, e.g., laptops, projectors while teaching 6. Passionate, committed and enthusiastic in teaching 7. Being professional and ethical Passionate, committed and enthusiastic in teaching 8. Confident in their expert understanding of a course 9. Have the capacity to solve students' immediate problems

*Source: Authors own work***Table A7***Summary of comprehensive higher education service quality measure model*

Author (s)	Sub-dimensions	Constructs or Variables
Oliso, et al.(2023)	Academic Facilities and Resources	<ol style="list-style-type: none"> 1. The classrooms are modern and up-to-date 2. The classrooms are equipped with teaching aids 3. The classrooms are well-ventilated and comfortable 4. The classrooms have functional natural and artificial lighting 5. The classrooms/ lecture halls have enough tables and chairs 6. The classrooms/lecture halls have enough sitting space 7. The university has adequate auditoriums, conference halls 8. The university has adequate lecture rooms 9. The university has adequate teaching laboratory facilities 10. The university has adequate computer labs and internet facilities 11. The university has quiet places to study on campus 12. The university has adequate teaching tools and equipment
	Academic Programme Issues	<ol style="list-style-type: none"> 1. Has a flexible and satisfactory syllabus 2. Provides reputable academic programs 3. Displays professional image 4. Has clearly defined course content and course objectives 5. Courses develop students' Knowledge, Skills and Attitude

Source: Authors own work

Table A8*Summary of comprehensive higher education service quality measure model*

Author (s)	Sub-dimensions	Constructs or Variables
Oliso, et al.(2023)	Quality of Instructional Practices	<ol style="list-style-type: none"> 1. Follow good teaching practices 2. Encourage students' active participation in their learning process 3. Provide regular feedback to students on their performance 4. Follow curriculum strictly 5. Complete the syllabus on time 6. Demonstrate adequate preparation for the lessons 7. Provide course outlines at the beginning of the semester 8. Stimulate students thinking by asking challenging questions 9. Provide clear expectations on coursework and assessment 10. Ensure they complete the syllabus 11. Set assessment tasks that challenge students to learn 12. Integrate both theory and practical learning experiences 13. Award grades that reflect individual students' ability 14. Provides students' placement services on time 15. Informs exam schedules on time 16. Registration takes place timely 17. Classes (teaching-learning process) take regularly 18. Releases examination results on time
	Quality of Library Services	<ol style="list-style-type: none"> 1. Has comfortable chairs and tables 2. Has adequate and latest academic resources/materials 3. Provides a conducive environment for study 4. Has convenient opening and closing hours 5. Facilitates access to internet resources 6. Staff are friendly and helpful 7. Staff provide prompt services to students

Source: Authors own work**Table A9***Summary of Comprehensive Higher Education Service Quality Measure Model*

Author (s)	Main Dimensions	Sub-dimensions	Constructs or Variables
Oliso, et al. (2023)	Non-academic Service Quality	Non-academic attitude and behavior	<ol style="list-style-type: none"> 1. Have a positive attitude toward the students 2. Have good communication with students 3. Provide caring and individualized attention 4. Show sincere interest in solving students' problems 5. Guarantee the confidentiality of students' information 6. Provide prompt and accurate services 7. Pay attention to details of the services sought by students 8. Are courteous and willing to help students 9. Are friendly and approachable 10. Are accessible during office hours
		Quality of administrative processes and procedures	<ol style="list-style-type: none"> 1. There is not that much bureaucracy and useless difficulties 2. There are clear and well-structured administrative procedures 3. There is transparency in official procedures and regulations
		Non-academic staff's competence	<ol style="list-style-type: none"> 1. Are knowledgeable and well experienced with university rules and procedures 2. Are well-experienced with the university's administrative activities 3. Efficient/prompt in dealing with students' complaints 4. Maintains accurate and retrieval records 5. Provide service within reasonable time frame

Source: Authors own work

Table A10*Summary of comprehensive higher education service quality measure model*

Author (s)	Main Dimensions	Constructs or Variables	Main Dimensions	Constructs or Variables	
Oliso, et al. (2023)	Quality of general infrastructure	1. Adequate water supply on the campus	University access to students	1. Supports students' associations	
		2. Sufficient number of toilets for students		2. Values and recognizes students' feedback for improvement	
		3. Separate male and female toilets		3. Has simple service delivery procedures for students	
		4. Adequate electricity supply		4. Staff are easily contacted (e-mail, telephone and so on)	
		5. Sufficient water supply in the toilets		5. Website is informative and helpful to students	
		6. Accessible internet services on campus			
		7. Buildings and grounds are very nice			
		8. Suitable buildings and facilities for students with disability			
		9. Adequate facilities for students with disability			
		10. Available transport facilities for students			
	Oliso, et al. (2023)	Quality of support services and facilities	1. Sufficient sports and recreation facilities	University Reputation	1. Has adequate experienced human resources
			2. Has adequate Cafeteria infrastructure		2. Has adequate campus facilities and equipment
3. Has adequate IT facilities			3. Has ideal campus location/layout		
4. Has adequate medical facilities			4. Maintains minimal class sizes		
5. Has adequate hostel facilities			5. Produces easily employable graduates		
6. Adequate photocopy facilities for students					
7. Has adequate extracurricular activities					
8. Separate male and female dormitories					
9. Has reasonable pricing on campus					
10. Provides counseling services to students					
11. Provides quality dormitory services					
12. Internet access on the campus					
Oliso, et al. (2023)	Quality of students' welfare services	1. Provides support mechanism for needy students			
		2. Promotes an independent students' union			
		3. Involve students in decision making			
		4. Provides equal treatment to students			
		5. Provides enough security services			

Source: Authors own work*Note:* Total dimensions of HESQM: 5 main dimensions and 9 sub-dimensions; No. of items: 116