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The Applications of Importance-Performance Analysis in Higher Education Institutions: A Text Mining of Literature

Afifah Hanim Md Pazil[a], Razli Che Razak[b], [a,b]Faculty of Entrepreneurship and Business, Universiti Malaysia Kelantan, 16100, Kota Bharu, Kelantan, Malaysia, Email: [a]hanim.mp@umk.edu.my, [b]razlicr@umk.edu.my

The application of the Importance-Performance Analysis (IPA) has received increasing attention in the educational sector. However, little effort has been made in reviewing its forms, particularly in the context of Higher Education Institutions (HEIs). Thus, this paper intends to systematically review the literature on the applications of the IPA in the context of HEIs. A total of 61 peer-reviewed journal articles (searched via the Scopus database) are referred to for this paper, and cover studies published from 1987 to 2019. The reviews have been categorised year-wise, country-wise and journal-wise to track the growth of the IPA applications. The studies have also been grouped according to how the IPA were used and are based on the functional areas wherein the IPA was applied in HEIs. The studies are summarised herein by various charts and table formats to help readers extract quick and meaningful information. The systematic review revealed that the IPA was applied in seven major domains of functional areas in HEIs, namely course, program or teaching evaluation; quality analysis; student or graduate assessment; higher education institutions or program selection; university facility management; strategic planning; and university library service quality enhancement. It is expected that this paper will serve as a comprehensive reference for IPA applications in HEIs, and act as an informative summary aid for researchers and practitioners in their future work. This will promote IPA's future development.

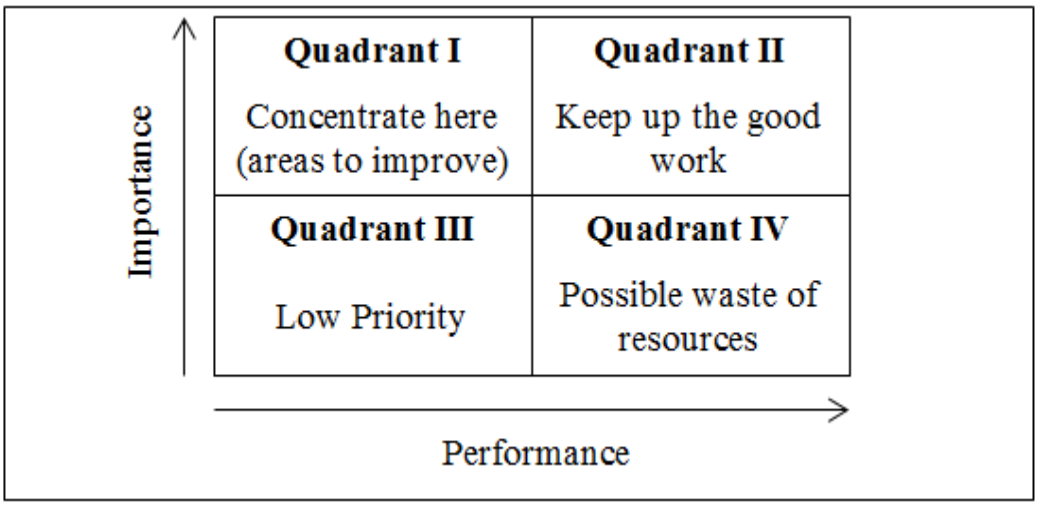
Key words: *Higher Education, Higher education institutions, Importance-Performance Analysis, Importance measurement, performance measurement.*

Introduction

Historically, higher education (HE) has progressed in many countries from a niche service consumed by a small elite to a mass-market service, whereby rising numbers of students are catered to by a diverse and growing number of service providers. The endowment of higher education institutions (HEIs) has typically developed from being a centrally planned service to one in which resources are allocated by market forces. As this market matures, service quality has become a mean of differentiating one HEI from others. There is a challenge facing practitioners in identifying and implementing the most appropriate measurement tools to gain a better understanding of the service quality issues that impact HEIs customer satisfaction. Disconfirmation approaches to measuring service quality have become pre-eminent in the HE sector (O'Neill & Palmer, 2004). Service quality can be conceptualised as the difference between customer expectation and perception. As indicated by Martilla and James (1977), in-service quality, a customer's wants, or desires can be measured by the level of service that customers expect to receive: it is represented by "importance". On the other hand, a customer's perception of the service received are represented by "performance". In studies undertaken within the context of HE, scholars frequently have measured importance (e.g. Manatos et al. 2015; Martínez Alarcón, 2015). Alternatively, other scholars have measured performance using models such as SERVQUAL (e.g. Leonnard, 2018), SERVPERF (e.g. Hossain et al., 2014) and HEdPERF (e.g. Sulaiman et al., 2019). According to Martilla and James (1977), Importance-Performance Analysis (IPA) is a technique that enables both the importance and performance to be measured simultaneously.

The IPA has been studied extensively for the last four decades due to its broad applicability, simplicity, ease of use and diagnostic value. The first article on IPA application by Martilla and James (1977) defines the IPA as a technique for measuring an attribute's importance and performance to further the development of effective marketing programs. To date, the article has been cited 4,310 times in Google Scholar (accessed 3 October 2019). The popularity of the technique lies in its perceived simplicity and the tangibility of the strategic management recommendations (Wohlfart & Hovemann, 2019), which are represented in a two-dimensional grid, namely as IPA matrix, that allocates specific attributes to one of the four quadrants (Figure 1). It consists of a pair of coordinate axes where "importance" is displayed along the y-axis, and "performance" is displayed along the x-axis. Each of the quadrants shows the combined rating of importance and performance of an attribute of the service assigned by the customers.

Figure 1. IPA Matrix



Each of the quadrants indicates a different strategic implication for the attributes. Quadrant I represents the attributes that are rated to be important by the customers, while performance is not perceived to be reliable. This indicates a requirement for corrective action to improve perceived performance; hence, it is needed to "concentrate here". Quadrant II represents the attributes that are rated by the customers as high both in importance and performance. This suggests the attributes are already functional; hence it is needed to "keep up the good work". Quadrant III represents the attributes that are rated by the customers as low both in importance and performance. Although the performance of the attributes is perceived as weak, these attributes are not regarded as important; hence "low priority" is needed. Quadrant IV represents the attributes that are rated less important by the customers, but the performance is perceived to be healthy. This signals the "possible waste of resources" since the effort exerted on these attributes is unnecessary and that resources may be better reallocating elsewhere. The goal of IPA is to identify the attributes in Quadrants I and II (Pike & Larkin, 2010), because the higher importance ratings, the more likely they are to play a critical role in determining customer satisfaction. IPA helps organisations recognise the attributes that need to be focused on in order to improve, as well as the particular action that should be taken in order to minimise the gap between the importance and performance of an attribute (Mohamad Shukri et al., 2014).

IPA is a useful multi-attribute technique for education providers seeking to improve performance in the areas that customers value and believe are essential. However, not enough attention has been paid to IPA application in the context of HE (McLeay et al., 2017). Efforts to review these techniques systematically, particularly in HEIs, is especially lacking. Therefore, a systematic literature review has been used for this study and will present an exploration of the IPA application in the HEIs from 1987 to 2019. As indicated by Hayrol Azril et al. (2018), a systematic review is an examination of a formulated question that uses systematic and explicit procedures to identify, select and critically appraise relevant research, as well as gather and

analyse data from studies that are included in the review. Accordingly, the goal of the present study is to fill the gap in identifying and classifying the existing functional areas of IPA application in HEIs.

Methodology

The technique used to gather articles related to the applications of IPA in HEIs is discussed in this section. The systematic literature review was guided by the PRISMA Statement (Preferred Reporting Items for Systematic reviews and Meta-Analyses). The PRISMA Statement calls for a rigorous search of terms related to the applications of IPA in HEIs. The systematic literature search was undertaken from the Scopus database. Scopus is one of the most significant abstract and citation databases of peer-reviewed literature, and is curated from 5,000 publishers worldwide with more than 22,800 journals. The main reason the Scopus database was selected was to ensure that only high quality journals were reviewed.

The systematic review process involved four stages. The review process was performed in July 2019. The first phase was to identify keywords used for the search process. Keywords similar and related to HEIs were used based on previous studies and a thesaurus. At this stage, 119 articles were identified through keywords used as below:

TITLE-ABS-KEY("importance-performance analysis" AND ("higher education" OR "higher learning" OR "tertiary education" OR "post-secondary education" OR "higher education institution*" OR "institution* of higher education*" OR "higher learning institution*" OR "institution* of higher learning" OR universit* OR college* OR polytechnic* OR "graduate school*" OR facult*))*

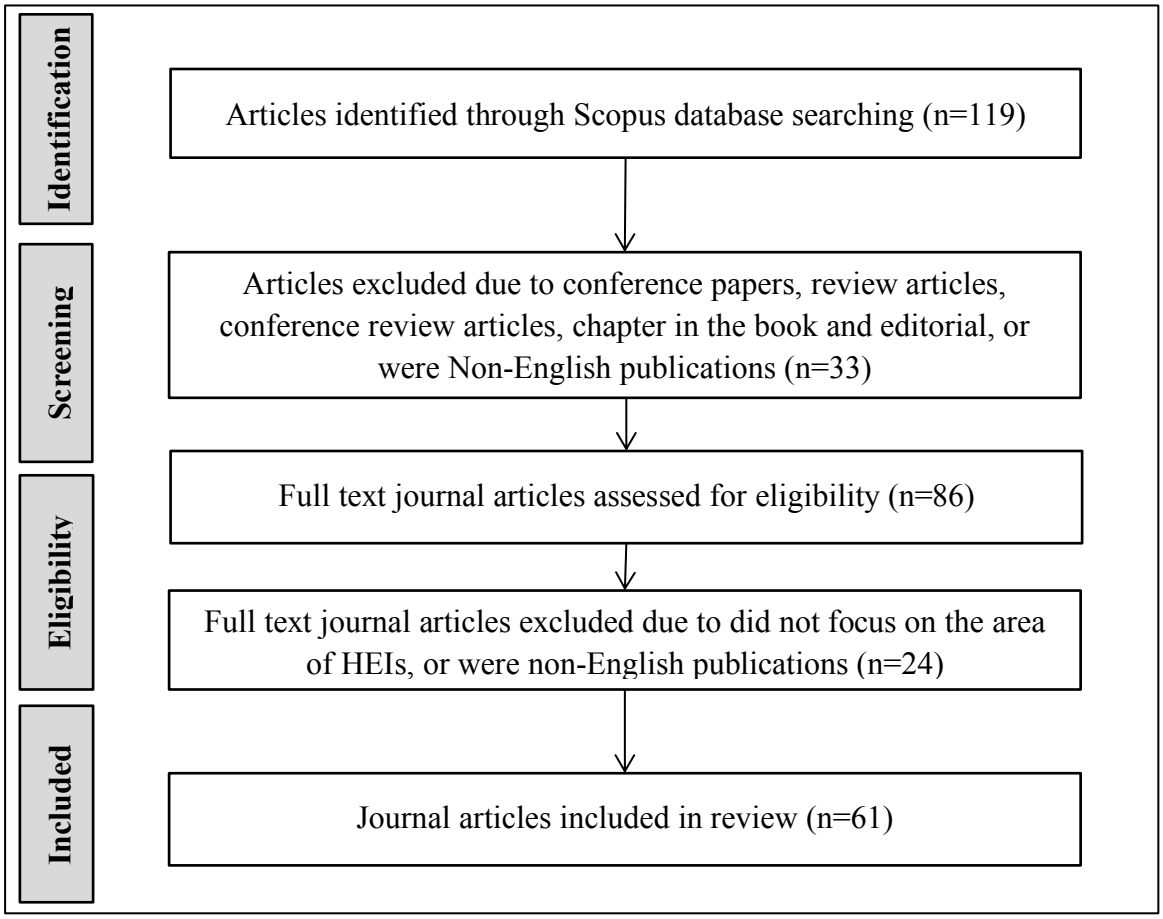
The second stage was screening. At this stage, a total number of 33 articles were removed out of the 119 articles eligible to be reviewed. As depicted in Table 1, two inclusion and exclusion criterion were determined. Firstly, in regard to the literature type, only journal articles were selected, which means conference papers, review articles, conference review articles, book chapters, and editorials were excluded. Secondly, the non-English publications were excluded from the search criteria and focused only on articles published in English to avoid any confusion and difficulty in translating.

Table 1: The inclusion and exclusion criteria

Criteria	Inclusion	Exclusion
Literature Type	Journal (research articles)	Conference papers, review articles, conference review articles, chapter in the book and editorial
Language	English	Non-English

The third stage was the eligibility of the 86 full journal articles that were accessed. A total number of 24 journal articles were excluded after careful inspection. Some did not focus on the area of HEIs and others were non-English publications. The final stage of the systematic review process found a total number of 61 journal articles that were fit to be used for assessment and analysis (Figure 2). The data was extracted by reading in-depth the 61 full journal articles to classify and analyse the major area wherein the IPA was applied in the context of HEIs.

Figure 2. The flow diagram of the systematic review process of the study



Classifications and Analyses of IPA Applications in HEIs

A total of 61 peer reviewed journal articles with reported IPA applications in HEIs were included in this review. Each journal article was classified according to the publication year, country of origin, journal, how the IPA was implemented, other integrated methodologies utilised simultaneously with the IPA (if any), and the functional area wherein the IPA was applied in the context of HEIs.

Figure 3 shows the year-wise distribution of the IPA applications in HEIs. It is interesting to see that the application of the IPA in HEIs has continued to increase exponentially during the year 2009-2019.

Figure 3. Distribution of 61 review journal articles in various years

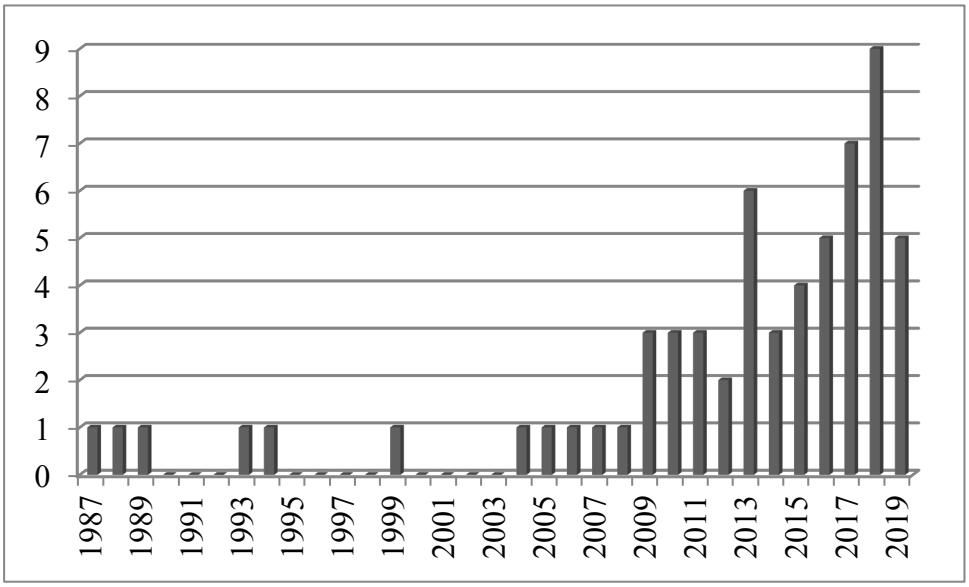


Table 2 classifies journal articles by country of origin. Among the 61 journal articles considered in this systematic review, Taiwan and the United States had the most significant number of published journal articles (10), followed by Malaysia (8), South Korea (6), Australia (5) and China (3).

Table 2: Classification of 61 review journal articles by country

No.	Country	Number of articles
1	Taiwan	10
2	United States	10
3	Malaysia	8
4	South Korea	6
5	Australia	5
6	China	3
7	Hong Kong	2
8	Hungary	2
9	Indonesia	2
10	Bangladesh	1
11	Cooperative Works (United States and New Zealand)	1
12	Cyprus	1
13	Egypt	1

14	Germany	1
15	India	1
16	Iran	1
17	Macao	1
18	Norway	1
19	Russia	1
20	Spain	1
21	Thailand	1
22	United Kingdom	1
	TOTAL	**61**

Table 3 lists the articles by journal. It reveals that the 61 reviewed articles on IPA applications in HEIs appeared in 52 different journals. The highest number of journal articles was published in the Journal of Marketing for Higher Education and the Journal of Teaching in Travel and Tourism.

Table 3: Classification of the journal with a number of articles

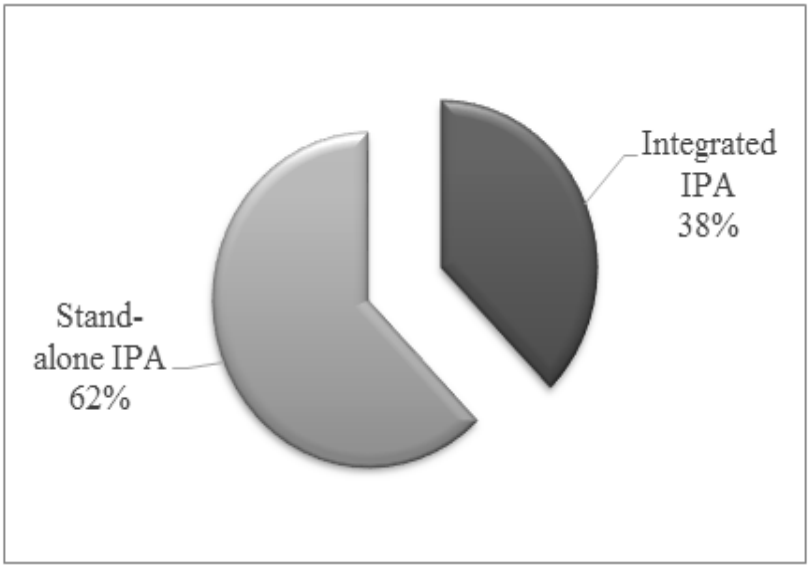
No.	**Name of the journal**	**Number of articles**
1	Journal of Marketing for Higher Education	4
2	Journal of Teaching in Travel and Tourism	4
3	Industry and Higher Education	2
4	Quality and Quantity	2
5	Quality Assurance in Education	2
6	Advanced Science Letters	1
7	Asia Life Sciences	1
8	Asia-Pacific Education Researcher	1
9	Assessment and Evaluation in Higher Education	1
10	Australian Journal of Basic and Applied Sciences	1
11	DESIDOC Journal of Library and Information Technology	1
12	Educational Studies	1
13	Evaluation and Program Planning	1
14	Higher Education	1
15	Information Management and Computer Security	1
16	International Journal of Applied Mathematics and Statistics	1
17	International Journal of Contemporary Hospitality Management	1
18	International Journal of Educational Management	1
19	International Journal of Electronic Marketing and Retailing	1
20	International Journal of Information Quality	1

21	International Journal of Quality and Reliability Management	1
22	International Journal of Quality and Service Sciences	1
23	Journal for Global Business Advancement	1
24	Journal of Applied Research in Higher Education	1
25	Journal of Asian Architecture and Building Engineering	1
26	Journal of Distribution Science	1
27	Journal of Foodservice Business Research	1
28	Journal of Forestry	1
29	Journal of Hospitality and Tourism Education	1
30	Journal of Hospitality, Leisure, Sport and Tourism Education	1
31	Journal of Management Development	1
32	Journal of Marketing Education	1
33	Journal of Open Innovation: Technology, Market, and Complexity	1
34	Journal of the American College Health Association	1
35	Journal of Theoretical and Applied Information Technology	1
36	Management Science Letters	1
37	Middle East Journal of Scientific Research	1
38	Oral Health and Preventive Dentistry	1
39	Periodica Polytechnica Social and Management Sciences	1
40	Problems of Education in the 21st Century	1
41	Quality in Higher Education	1
42	Scandinavian Journal of Educational Research	1
43	Science and Technology Libraries	1
44	Scientometrics	1
45	Sustainability	1
46	Technology Analysis and Strategic Management	1
47	The Journal of biocommunication	1
48	The Journal of Services Marketing	1
49	The TQM Journal	1
50	Total Quality Management and Business Excellence	1
51	Turkish Online Journal of Educational Technology	1
52	World Transactions on Engineering and Technology Education	1
	TOTAL	**61**

It is observed that the recent focus of the IPA has been confined to the application of the integrated IPA rather than the stand-alone IPA. It can be seen from Figure 4 that a total of 38 review journal articles (62%) applied IPA as an independent methodology, without integrating

with other methods. This value indicates that the number of applications in which IPA was the stand-alone method is higher than the amount of the applications involving integrated IPA. A large number of implementation of the IPA as an independent methodology shows that HEIs practitioners consider IPA as a credible methodology in its own right.

Figure 4. Nature of application of the IPA



The association of the integrated methodologies to IPA application in HEIs are tabulated in Table 4. Among the methods, SERVQUAL and LibQUAL were the most popular methodology to be combined with IPA. Other ways that the IPA was integrated was Factor Analysis, Balanced Scorecard, Delphi Method, Entropy Method, Mutual Information Method, Fuzzy Logic Model (FIPA), Fuzzy-Impact Matrix Cross-Reference Multiplication Applied to a Classification (MICMAC), Fuzzy Analytical Hierarchical Process (FAHP), Fuzzy Analytical Network Process (FANP), Decision-making trial and evaluation laboratory (DEMATEL), Technique for Order Preference by Similarity to an Ideal Solution (TOPSIS), Internal Evaluation, Plan-Do-Check-Act (PDCA), Cause and Effect Analysis, Repertory Grid Analysis, Response Surface Methodology (RSM), Six Sigma DMAIC (Define, Measure, Analyse, Improve, and Control), WebQUAL and Fishbone Diagram.

Table 4: Integrated methodologies with reference articles

Integrated methodology/ technique/ tool	**Reference articles**
SERVQUAL	Surman and Tóth (2019) Mamun-ur-Rashid and Rhman (2017) Mostafa (2006) O'Neill and Palmer (2004)
LibQUAL	Asyraf et al. (2019) Mallya and Patwardhan (2018) Xi et al. (2016)
Factor Analysis	McLeay et al. (2017) Angell et al. (2008)
LibQUAL, Fuzzy-Impact Matrix Cross-Reference Multiplication Applied to a Classification (MICMAC)	Chen (2018)
Balanced Scorecard	Jairak and Praneetpolgrang (2013)
Balanced Scorecard, Delphi Method	Kim et al. (2018)
Entropy Method	Park et al. (2013)
Entropy Method, Mutual Information Method	Shieh and Wu (2011)
Fuzzy Logic Model (FIPA)	Wang et al. (2010)
Fuzzy-Analytic Hierarchy Process(FAHP)	Chen et al. (2015)
Fuzzy Analytical Hierarchical Process (FAHP), Fuzzy Analytical Network Process (FANP), Decision-making trial and evaluation laboratory (DEMATEL), Technique for Order Preference by Similarity to an Ideal Solution (TOPSIS)	Chen and Chen (2012)
Internal Evaluation	Mourkani and Shohoodi (2013)
Plan-Do-Check-Act (PDCA), Cause and Effect Analysis	Eszter et al. (2013)
Repertory Grid Analysis	Pike (2005)
Response Surface Methodology (RSM)	Pak (2016)
Six Sigma DMAIC (Define, Measure, Analyse, Improve, and Control)	Yu and Ueng (2012)
WebQUAL, Fishbone Diagram	Gata and Oryza Gilang (2017)

For the functional areas of application, there are seven major domains wherein the IPA was applied in the context of HEIs. As shown in Table 5, a great interest of IPA in HEIs is dominantly applied in *course, program or teaching evaluation* with 14 studies, followed by *quality analysis* (12 studies). A few other journal articles have utilised IPA application in *students or graduates assessment* (10 studies), *higher education institutions or program selection* (8 studies), university *facility management* (7 studies), *strategic planning* (6 studies), and *university library service quality enhancement* (4 studies).

Table 5: Functional areas of IPA application in HEIs and associated reference articles

Functional areas of application (Number of articles)	**Reference articles**
Course, program or teaching evaluation (14)	Surman and Tóth (2019); Byun et al. (2018); Chen et al. (2018); Park et al. (2018); Lee and Joung (2017); Patiar et al. (2017); Pak (2016); Eszter Tóth et al. (2013); Yu and Ueng (2012); Pike and Larkin (2010); Rauch et al. (2010); Wang et al. (2010); Al-Hakim (2007); Ortinau et al. (1989).
Quality analysis (12)	Gata and Oryza Gilang (2017); Mamun-ur-Rashid and Rhman (2017); McLeay et al. (2017); Yang et al. (2016); Chen et al. (2015); Kusumawati (2015); Mourkani and Shohoodi (2013); Park et al. (2013); Iacovidou et al. (2009); Angell et al. (2008); Mostafa (2006); O'Neill and Palmer (2004).
Students or graduates assessment (10)	Andrades and Dimanche (2019); Kelly and Brown (2019); Wohlfart and Hovemann (2019); Chen (2018); Jegatheesan et al. (2018); Jegatheesan et al. (2017); Lo et al. (2014); Mohamad Shukri et al. (2014); Salina et al. (2011a); Salina et al. (2011b).
Higher education institutions or program selection (8)	Hanssen and Mathisen (2016); Lee and Chatfield (2015); Wong et al. (2015); To et al. (2014); Pike (2005); Ford et al. (1999); Dolinsky and Quazi (1994); Chapman (1993).
University facility management (7)	Kim et al. (2018); Dewi (2013); Qiao and Zhang (2013); Shieh and Wu (2011); Shieh and Wu (2009); Rupp et al. (1988); Kennedy and Kennedy (1987).
Strategic planning (6)	Hur (2018); Chen (2017); Lai and Lu (2016); Jairak and Praneetpolgrang (2013); Chen and Chen (2012); del Barrio-García and Luque-Martínez (2009).
University library service quality enhancement (4)	Asyraf et al. (2019); Chen (2018); Mallya and Patwardhan (2018); Xi et al. (2016).

Conclusions

The present study has made an attempt to systematically review the applications of IPA in the context of HEIs starting from the year of 1987 to 2019 in 61 peer-reviewed journal articles (searched via Scopus database). As the benefits of IPA become more understood, it is expected that the IPA application in HEIs will gain more popularity worldwide in the future. The finding of the present study supports the accuracy of this prediction because the demand for IPA has continued to increase exponentially during the years 2009-2019. Moreover, country-based classifications demonstrate the widespread use of IPA. It is also believed that the growth in the application of the integrated IPA methodologies would expand in the coming years. This is due to the present study's finding that IPA application in HEIs seems to focus more on the stand-alone IPA methodology. Based on the systematic review, seven major domains of functional areas where the IPA was applied in HEIs were identified, namely *course, program or teaching evaluation; quality analysis; students or graduates assessment; higher education institutions or program selection; university facility management; strategic planning;* and *university library service quality enhancement*. Finally, it is hoped that this systematic review can serve the needs of the researchers and practitioners for comprehensive references of IPA applications in HEIs, and thereby guide them towards the advancement of these methodologies.

REFERENCES

Al-Hakim, L. (2007). Perception of students on performance of dual-mode education: Information Quality perspective. *International Journal of Information Quality, 1*(3), 314-325. doi:10.1504/IJIQ.2007.016394

Andrades, L., & Dimanche, F. (2019). Destination competitiveness in Russia: Tourism professionals' skills and competences. *International Journal of Contemporary Hospitality Management, 31*(2), 910-930. doi:10.1108/IJCHM-11-2017-0769

Angell, R.J., Heffernan, T.W., & Megicks, P. (2008). Service quality in postgraduate education. *Quality Assurance in Education, 16*(3), 236-254. doi:10.1108/09684880810886259

Asyraf Afthanorhan, Zainudin Awang, Norfadzilah Rashid, Hazimi Foziah, & Puspa Liza Ghazali. (2019). Assessing the effects of service quality on customer satisfaction. *Management Science Letters, 9*(1), 13-24. doi:10.5267/j.msl.2018.11.004

Byun, C.G., Sung, C.S., Park, J.Y., & Choi, D.S. (2018). A study on the effectiveness of entrepreneurship education programs in higher education institutions: A case study of Korean graduate programs. *Journal of Open Innovation: Technology, Market, and Complexity, 4*(3). doi:10.3390/joitmc4030026

Chapman, R.G. (1993). Non-simultaneous relative Importance-Performance Analysis. *Journal of Marketing for Higher Education, 4*(1-2), 405-422, doi:10.1300/J050v04n01_27

Chen, I.S., Chen, J.K., & Padró, F.F. (2015). Critical quality indicators of higher education. *Total Quality Management and Business Excellence, 28*, 130-146. doi:10.1080/14783363.2015.1050178

Chen, J.K. (2018). A novel Kaizen technique for service quality: case study in educational organization. *The TQM Journal, 30*(4), 269-280. doi:10.1108/TQM-10-2017-0109

Chen, J.K., & Chen, I.S. (2012). An Inno-Qual performance system for higher education. *Scientometrics, 93* (3), 1119-1149. doi:10.1007/s11192-012-0759-9

Chen, K.H.J. (2017). Contextual influence on evaluation capacity building in a rapidly changing environment under new governmental policies. *Evaluation and Program Planning, 65*, 1-11. doi:10.1016/j.evalprogplan.2017.06.001

Chen, Y.C. (2018). Applying Importance-Performance Analysis to assess student employability in Taiwan. *Journal of Applied Research in Higher Education, 10*(1), 76-86. doi:10.1108/JARHE-10-2017-0118

Chen, M., Wu, Y.J., & Tsai, K.M. (2018). Building an industry-oriented business sustainability curriculum in higher education. *Sustainability, 10* (12). doi:10.3390/su10124698

del Barrio-García, S., & Luque-Martínez, T. (2009). The value of client perceptions in university strategic planning: An empirical research study. *Industry & Higher Education, 23*(6), 423-436. doi:10.5367/000000009790156391

Dewi, F.D., Gundavarapu, K.C., & Cugati, N. (2013). Importance-Performance Analysis of dental satisfaction among three ethnic groups in Malaysia. *Oral Health and Preventive Dentistry, 11*(2), 131-139. doi:10.3290/j.ohpd.a29735

Dolinsky, A.L., & Quazi, H.A. (1994). A diagnostic technique for formulating marketing strategies in higher education based on relative competitive position. *Journal of Marketing for Higher Education, 5*(2), 89-101. doi:10.1300/J050v05n02_05

Eszter Tóth, Z., Jónás, T., Bérces, R., & Bedzsula, B. (2013). Course evaluation by Importance-Performance Analysis and improving actions at the Budapest University of Technology and Economics. *International Journal of Quality and Service Sciences, 5*(1), 66-85. doi:10.1108/17566691311316257

Ford, J.B., Joseph, M., & Joseph, B. (1999). Importance-Performance Analysis as a strategic tool for service marketers: The case of service quality perceptions of business students in New Zealand and the USA. *The Journal of Services Marketing, 13*(2), 171-186. doi:10.1108/08876049910266068

Gata, W., & Oryza Gilang, H. (2017). Analysis of information system quality of service on BSI Academy's environment using WebQUAL Methods, Importance Performance Analysis and Fishbone. *Journal of Theoretical and Applied Information Technology, 95*(2), 229-241.

Hanssen, T.E.S., & Mathisen, T.A. (2016). Exploring the attractiveness of a Norwegian rural higher education institution using Importance-Performance Analysis. *Scandinavian Journal of Educational Research, 62*(1), 68-87. doi:10.1080/00313831.2016.1212254

Hayrol Azril Mohamed Shaffril, Krauss, S.E., & Samsul Farid Samsuddin. (2018). A systematic review on Asian's farmers' adaptation practices towards climate change. *Science of the Total Environment, 644*, 683-695. doi:10.1016/j.scitotenv.2018.06.349

Hossain, M.J., Islam, A., & Saadi, M.S. (2014). Evaluating users' experience of service performance using SERVPERF scale: A case study of some private university libraries in Bangladesh. *Annals of Library and Information Studies, 60*(4), 249-259.

Hur, Y.J. (2018). Areas of improvement of university education: Focus on the difference of importance and satisfaction. *Asia Life Sciences, 15*(4), 2641-2652.

Iacovidou, M., Gibbs P., & Zopiatis A. (2009). An exploratory use of the stakeholder approach to defining and measuring quality: The case of a Cypriot higher education institution. *Quality in Higher Education, 15*(2), 147-165. doi:10.1080/13538320902995774

Jairak, K., & Praneetpolgrang, P. (2013). Applying IT governance balanced scorecard and importance-performance analysis for providing IT governance strategy in university. *Information Management & Computer Security, 21*(4), 228-249. doi:10.1108/IMCS-08-2012-0036

Jegatheesan Rajadurai, Noraina Mazuin Sapuan, Salina Daud, & Nurazariah Abidin. (2017). Creating industry driven sustainable technical graduates: A case from Malaysia. *Advanced Science Letters, 23*(4), 2842-2845. doi:10.1166/asl.2017.7706

Jegatheesan Rajadurai, Noraina Mazuin Sapuan, Salina Daud, & Nurazariah Abidin. (2018). The marketability of technical graduates from Higher Educational Institutions (HEIs) offering Technical and Vocational Education and Training (TVET): A case from Malaysia. *Asia-Pacific Education Researcher, 27*(2), 137-144. doi:10.1007/s40299-018-0372-7

Kelly, E.C., & Brown, G. (2019). Who are we educating and what should they know? An assessment of forestry education in California. *Journal of Forestry, 117*(2), 95-103. doi:10.1093/jofore/fvy079

Kennedy, D.W., & Kennedy, S.L. (1987). Using Importance-Performance Analysis for evaluating university health services. *Journal of the American College Health Association, 36*(1), 27-31, doi:10.1080/07448481.1987.9939649

Kim, Y., Kim, M.S., & Kim, J.H. (2018). Development of key performance indicators for the improvement of university facility management services in Korea. *Journal of Asian Architecture and Building Engineering, 17*(2), 313-320. doi:10.3130/jaabe.17.313

Kusumawati, A. (2015). Service evaluation of educational process through Importance-Performance Analysis: The empirical findings of Brawijaya University Indonesia. *Turkish Online Journal of Educational Technology, 2015*, 494-504.

Lai, I.K.W., & Lu, T.W. (2016). How to improve the university–industry collaboration in Taiwan's animation industry? Academic vs. industrial perspectives. *Technology Analysis and Strategic Management, 28*(6), 717-732. doi:10.1080/09537325.2016.1141404

Lee, K.W., & Joung, H.W. (2017). An examination of students' perceptions for guest speakers in hospitality and tourism programs. *Journal of Teaching in Travel and Tourism, 17*(4), 300-312. doi:10.1080/15313220.2017.1361888

Lee, S., & Chatfield, H.K. (2015). A multivariate repeated measure analysis of importance and performance on college choice: A case study of UNLV Hotel College students. *Journal of Teaching in Travel and Tourism, 15*, 125-149. doi:10.1080/15313220.2015.1026473

Leonnard. (2018). The performance of SERVQUAL to measure service quality in private university. *Journal on Efficiency and Responsibility in Education and Science, 11*(1), 16-21. doi:10.7160/eriesj.2018.110103

Lo, A.S., Mak, B., & Chen, Y. (2014). Do travel agency jobs appeal to university students? A case of tourism management students in Hong Kong. *Journal of Teaching in Travel & Tourism, 14*(1), 87-121. doi:10.1080/15313220.2014.872908

Mallya, J., & Patwardhan, V. (2018). Hospitality students' perception of college library service quality: Importance-Performance Analysis. *DESIDOC Journal of Library and Information Technology, 38*(2), 125-131. doi:10.14429/djlit.38.2.11449

Mamun-ur-Rashid, M., & Rhman, M.Z. (2017). Quality of higher education in Bangladesh: Application of a modified SERVQUAL model. *Problems of Education in the 21st Century, 75*(1), 72-91.

Manatos, M.J., Rosa, M.J., & Sarrico, C.S. (2015). The importance and degree of implementation of the European standards and guidelines for internal quality assurance in universities: the views of Portuguese academics. *Tertiary Education and Management, 21*(3), 245-261. doi:10.1080/13583883.2015.1061587

Martilla, J.A., & James, J.C. (1977). Importance-Performance Analysis. *Journal of Marketing, 41*(1), 77-79.

Martínez Alarcón, M.C. (2015). Quality perception and importance of its components in the university formation of kinesiology. *Revista Cubana de Educacion Medica Superior, 29*(3), 457-467.

McLeay, F., Robson, A., & Mazirah Yusoff. (2017). New applications for Importance-Performance Analysis (IPA) in higher education: Understanding student satisfaction. *Journal of Management Development, 36*(6), 780-800. doi:10.1108/JMD-10-2016-0187

Mohamad Shukri Abdul Hamid, Rafikul Islam, & Noor Hazilah Abd Manaf. (2014). Malaysian graduates' employability skills enhancement: An application of the Importance-

Performance Analysis. *Journal for Global Business Advancement, 7*(3), 181-197. doi:10.1504/JGBA.2014.064078

Mostafa, M.M. (2006). A comparison of SERVQUAL and I-P Analysis: Measuring and improving service quality in Egyptian private universities. *Journal of Marketing for Higher Education, 16*(2), 83-104. doi:10.1300/J050v16n02_04

Mourkani, G.S., & Shohoodi, M. (2013). Quality assurance in higher education: Combining internal evaluation and Importance-Performance Analysis models. *Middle East Journal of Scientific Research, 15*(5), 643-651. doi:10.5829/idosi.mejsr.2013.15.5.217

O'Neill, M.A., & Palmer, A. (2004). Importance-Performance Analysis: A useful tool for directing continuous quality improvement in higher education. *Quality Assurance in Education, 12*(1), 39-52. doi:10.1108/09684880410517423

Ortinau, D.J., Bush, A.J., Bush, R.P., & Twible, J.L. (1989). The Use of Importance-Performance Analysis for improving the quality of marketing education: Interpreting faculty-course evaluations. *Journal of Marketing Education, 11*(2), 78-86. doi:10.1177/027347538901100213

Pak, R.J. (2016). Combination of Importance-Performance Analysis and Response Surface Methodology for enhancing satisfaction. *International Journal of Quality and Reliability Management, 33*(6), 792-802. doi:10.1108/IJQRM-06-2014-0079

Park, O.J., Lehto, X.Y., & Houston, C.R. (2013). Assessing competitive attributes of service quality in university foodservice. *Journal of Foodservice Business Research, 16*(3), 235-254, doi:10.1080/15378020.2013.810526

Park, S.H., Yoo, H., Kim, K.-B., & Lee, T.J. (2018). Perceptions of university students of 'tourism-focused English' as a second language: The case of Korean universities. *Journal of Hospitality, Leisure, Sport and Tourism Education, 23*, 59-69. doi:10.1016/j.jhlste.2018.05.001

Patiar, A., Ma, E., Kensbock, S., & Cox, R. (2017). Hospitality Management Students' Expectation and Perception of a Virtual Field Trip Web Site: An Australian Case Study Using Importance–Performance Analysis. *Journal of Hospitality and Tourism Education, 29*(1), 1-12. doi:10.1080/10963758.2016.1266941

Pike, S. (2005). The use of Repertory Grid Analysis and Importance-Performance Analysis to identify determinant attributes of universities. *Journal of Marketing for Higher Education, 14*(2), 1-18. doi:10.1300/J050v14n02_01

Pike, S., & Larkin, I. (2010). Longitudinal evaluations of student satisfaction with a postgraduate unit using Importance-Performance Analysis. *Journal of Teaching in Travel and Tourism, 10*, 215-231. doi:10.1080/15313220.2010.503531

Qiao, L., & Zhang, S. (2013). Factor analysis for quality perception of college campus green land based. *International Journal of Applied Mathematics and Statistics, 44*(14), 152-159.

Rauch, D.A., Nale, R.D., Wathen, S.A., & Barr, P.B. (2010). An application of Importance-Performance Analysis to university marketing. *International Journal of Electronic Marketing and Retailing, 3*(1), 55-65. doi:10.1504/IJEMR.2010.030507

Rupp, M.T., Segal, R., & Pathak, D.S. (1988). Program planning of a biomedical communications center: An implementation-oriented approach. *The Journal of Biocommunication, 15*(1), 2-8.

Salina Daud, Noraina Mazuin Sapuan, Nurazariah Abidin, & Jegatheesan Rajadurai. (2011a). Do business graduates' attributes fulfill industry requirements and expectations? *Australian Journal of Basic and Applied Sciences, 5*(9), 68-74.

Salina Daud, Nurazariah Abidin, Noraina Mazuin Sapuan, & Jegatheesan Rajadurai. (2011b). Enhancing university business curriculum using an Importance-Performance Approach: A case study of the business management faculty of a university in Malaysia. *International Journal of Educational Management, 25*(6), 545-569. doi:10.1108/09513541111159059

Shieh, J.I., & Wu, H.H. (2009). Applying Importance-Performance Analysis to compare the changes of a convenient store. *Quality and Quantity, 43*, 391-400. doi:10.1007/s11135-007-9111-5

Shieh, J.I., & Wu, H.H. (2011). Applying information-based methods in Importance-Performance Analysis when the information of importance is unavailable. *Quality and Quantity, 45*, 545-557. doi:10.1007/s11135-010-9312-1

Sulaiman Mohammed Khalid, Khairul Anuar Mohd. Ali, & Zafir Khan Mohamed Makhbul. (2019). Assessing the effect of higher education service quality on job satisfaction among lecturers in premier polytechnics using HEdPERF model. *LogForum, 15*(3), 425-436. doi:10.17270/J.LOG.2019.356

Surman, V., & Tóth, Z.E. (2019). Developing a service quality framework for a special type of course. *Periodica Polytechnica Social and Management Sciences, 27*(1), 66-86. doi:10.3311/PPso.12201

To, W.M., Lung, J.W.Y., Lai, L.S.L., & Lai, T.M. (2014). Destination choice of cross-border Chinese students: An Importance-Performance Analysis, *Educational Studies, 40*(1), 63-80, doi:10.1080/03055698.2013.858615

Wang, R., Tai, D.W.S., Chen, J.S., & Yang, K.L. (2010). Holistic effectiveness of e-learning systems using fuzzy Importance-Performance Analysis (IPA) in uncertainty. *World Transactions on Engineering and Technology Education, 8*(2), 156-161.

Wohlfart, O., & Hovemann, G. (2019). Using Importance–Performance Analysis to bridge the information gap between industry and higher education. *Industry and Higher Education.* doi:10.1177/0950422219838465

Wong, P., Ng, P.M.L., Mak, C.K.Y., & Chan, J.K.Y. (2015). Students' choice of sub-degree programmes in self-financing higher education institutions in Hong Kong. *Higher Education, 71*(4), 455-472. doi:10.1007/s10734-015-9915-5

Xi, Q., Li, X., Zhao, H., He, Q., & Cai, Z. (2016). Service Quality Assessment at the Nanjing Agricultural University Based on LibQUAL. *Science and Technology Libraries, 35*(4), 338-349. doi:10.1080/0194262X.2016.1224993

Yang, H.C., Kim, J.B., & Kim, A.S. (2016). Different perception on product attributes of HMR: Focusing on college students and consumers. *Journal of Distribution Science, 14*(2), 47-56. doi:10.15722/jds.14.2.201602.47

Yu, K.T., & Ueng, R.G. (2012). Enhancing teaching effectiveness by using the Six-Sigma DMAIC model. *Assessment & Evaluation in Higher Education, 37*(8), 949-961. doi:10.1080/02602938.2011.592933