International Journal of Leading Research Publication (IJLRP)

E-ISSN: 2582-8010 ● Website: www.ijlrp.com ● Email: editor@ijlrp.com

Influential Factors in Higher Education Management: Updated Meta-analyses

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Abstract:
Studies on various aspects of higher education management have been conducted extensively. Some of those studies discuss models of the relationships between a number of factors influencing the performance of higher education, providing some insights for higher education management. However, the studies present different factors, depends on the case they analyzed, and the result of the relationship between factors vary and even contradict one to another. Thus, it is confusing for practitioners or other parties to use the results for their case. This study reviews, summarizes, and compiles 29 quantitative studies on higher education management published during 2016–2026 to get a general conclusion about the relationship among influential factors in higher education management, by applying a series of meta-analyses. From the 18 constructs involved in the initial model, the meta-analyses reduce them into 13 significant-influential constructs, that is consisting of: human resources, services, facilities, information technology, students' behavior, and public relations as the independent variables; academic environment, brand awareness, perceived value, student satisfaction, and reputation as mediating variables; loyalty and decision to choose as dependent variables. The standardized effect sizes resulted from the meta-analyses are in the range of 0.342 to 0.872 with composite reliabilities between 0.772 and 0.954. The interesting finding from the meta-analyses is that marketing and media, which are commonly believed as influencing factors in the higher education management practices, could not be proven to be the significant factors.

Keywords: higher education, management, influential factor, meta-analysis, effect size.

1. INTRODUCTION

Higher education (HE) takes role and is responsible to make the world better in many aspects, for instance, to develop people [1, 2, 3, 4], to drive students and people awareness on environmental issues [5, 6, 7, 8, 9, 10], to develop future technology [6, 11], to encourage actions for sustainability [1, 2, 8, 9, 12, 13], to stimulate entrepreneurial capability [14, 15, 16, 17, 18], to drive innovation [6, 18, 19], and to drive economic development [4, 6, 8]. All the expected outcomes and impacts start from the activities and processes in higher education institutions (HEIs), from student recruitment until graduation. Hence, comprehension on the factors influencing the performance of HEIs becomes important to enhance the HEIs performance. Moreover, the society is always dynamic, as are the needs for education, so that the expected outcomes from HEIs will always change over time. Thus, discussions about the factors influencing the performance of HEIs are always present and interesting.

Many studies about HE and its related aspects has been conducted for years. The topics are around tangible resources, intangible potentials, and outcomes of HEIs activities and processes. The HEIs tangible resources cover human resources, financial aspects, facilities, technology, location, and media [20, 21, 22, 23, 24, 25]. The intangible potentials include services, student behavior, public relation, marketing, and some external factors [20, 24, 25, 26, 27, 28]. The outcomes of HEIs activities and processes consist of academic environment, institution brand awareness, institution perceived value, student satisfaction,

institution reputation, stakeholders' loyalty, and stakeholders' decision to choose or recommend the institution [20, 23, 24, 25, 26, 27].

The studies mentioned in the previous paragraph are quantitative studies that is useful for HE practitioners to not only find insight but also clear measurable conclusions. However, the studies are mostly behavioral case studies, and each of the study has different variables to be analyzed. Meanwhile, the real case faced by the HE practitioners may be not completely fit to the studies referred. Therefore, a general finding on the relationships among the various influencing factors in HEIs management is required, and it can be facilitated by a meta-analysis on some statistically-adequate studies.

Some meta-analysis studies about HE in the last three years are focused on specific issues like the effect of learning method on performance [29, 30], factors for site selection [31], the use and impact of digital technologies [32, 33, 34, 35], and branding [36]. An updated (last three years) meta-analysis embracing various HEIs management factors comprehensively could not be found. Thus, this study aims to apply a series of meta-analyses on the findings of other recent studies in the scope of HE and HEIs management, to get a general model that can be referred by other related studies on HE for next several years. For HE practitioners, the computation results of this study can be utilized as one of the considerations to make a decision for their HEIs.

2. METHODOLOGY

In general, the steps of this study are: (1) searching the relevant articles and selecting the appropriate articles for meta-analyses, (2) construction of an initial model, (3) collecting the data of effect sizes, (4) correction on the sampling errors and the measurement errors, (5) calculating the composite effect sizes for each variables relationship, (6) deletion of the insignificant and weak relationships to revise the model, and (7) determination of the final model.

Using keywords of 'higher education management' or 'higher education factor' in the document title to search scholarly journal articles with English as the language [37], a number of 1,147 articles is found. Then, by filtering the publication date within the last 10 years, a number of 932 articles are selected. Furthermore, by adding the searching criteria with 'brand', 'value', 'satisfaction', 'reputation', and 'decision' in the abstract, the result is narrowed to 563 articles. A manual selection of the relevancy of the document titles reduces the number of articles to around 25%. Lastly, because the meta-analyses need inferential statistical data from some studies, manual observation on the articles' content is conducted, resulting 29 articles to be involved in the meta-analyses. The data collected in the 29 studies are in the range of 132 to 3,241. All the 29 articles are case studies located around the world, namely USA, Spain, England, Australia, Egypt, Turkey, Indonesia, Malaysia, Pakistan, Sri Lanka, Vietnam, Latvia, Slovenia, Brazil, India, Colombia, Peru, China, Tunisia, Morocco, Ghana, Iran, and Iraq.

The data collected basically are the effect sizes of the relationship between two variables. An effect size can be a correlation coefficient, or an F value of linear relationship, or a t value of linear relationship, or a path coefficient if the analysis using structural equation model (SEM).

3. INITIAL MODEL CONSTRUCTION

The development of initial model begins with the identification of HEIs management factors from the 29 articles used in the meta-analyses, as the variables of the model. Table 1 shows the symbols of the variables, the descriptions, and the category. Further, Part 3.1, 3.2, and 3.3 explain more detail about the factors.

Table 1: The Variables of the Model

Variable	Description	Variable Category
HR	Human resources	Independent
FI	Financial aspects	Independent
SR	Services	Independent
FC	Facilities	Independent
IT	Information technology	Independent
MD	Media	Independent
SB	Students' behavior	Independent
PR	Public relations	Independent
MK	Marketing	Independent
LO	Location	Independent
EX	External factors	Independent
EV	Academic environment	Mediating tier 1
BA	Brand awareness	Mediating tier 1
VA	Perceived value	Mediating tier 2
SA	Student satisfaction	Mediating tier 2
RP	Reputation	Mediating tier 3
LY	Loyalty	Dependent
DC	Decision to choose or recommend	Dependent

3.1. Tangible Resources in HEIs

The HEIs tangible resources mostly discussed in recent studies and being involved in this study are human resources, financial aspects, facilities, technology, location, and media used in HEIs management. Studies discussing human resources highlight competency and quality of teachers, competency of academic staffs, leadership, and the relation of teacher and students [26, 38, 39, 40]. Studies about financial aspects mostly focus on financial attributes, price and pricing, incentives, and scholarships [25, 26, 38, 41, 42]. Facilities and technology discussions in the previous studies cover physical facilities, infrastructures, information and communication technology, and e-learning facilities [20, 38, 40, 43, 44, 45]. Location discussions are related to the effect of country where an institution placed to the behavior and performance of HEIs [46, 47]. Recent studies about institution physical location is rarely found, regarding to the digitalization in most aspects of HEIs activities. Media discussions is related to website and social media used to share information for, from, and among the community in an institution and public area [20, 21, 22, 23, 24, 25, 28, 44, 47, 48, 49].

3.2. Intangible Potential Related to HEIs

The intangible potentials of HE management that mostly discussed in recent studies are includes services, student behavior, public relation, marketing, and some external factors. Services in HE that mostly discussed in recent studies are service attributes, service types, and service quality [20, 23, 25, 26, 27, 43, 44, 47, 49, 50, 51]. Student behavior discussions in recent studies are about relationship behavior like student-student interactions and ethical perceptions, and about studying behavior like participation in activities, information seeking, and information sharing [25, 28, 38, 40]. Other tangible aspects are public relations and marketing, that discussed in many studies [25, 26, 42, 47, 49, 51, 52]. External factors influencing HE performance studied recently are basically related to the perception include words of mouth (WOM), feedback, advocacy, helping, tolerance, and graduate employability [20, 24, 25, 28, 39, 41, 44, 48].

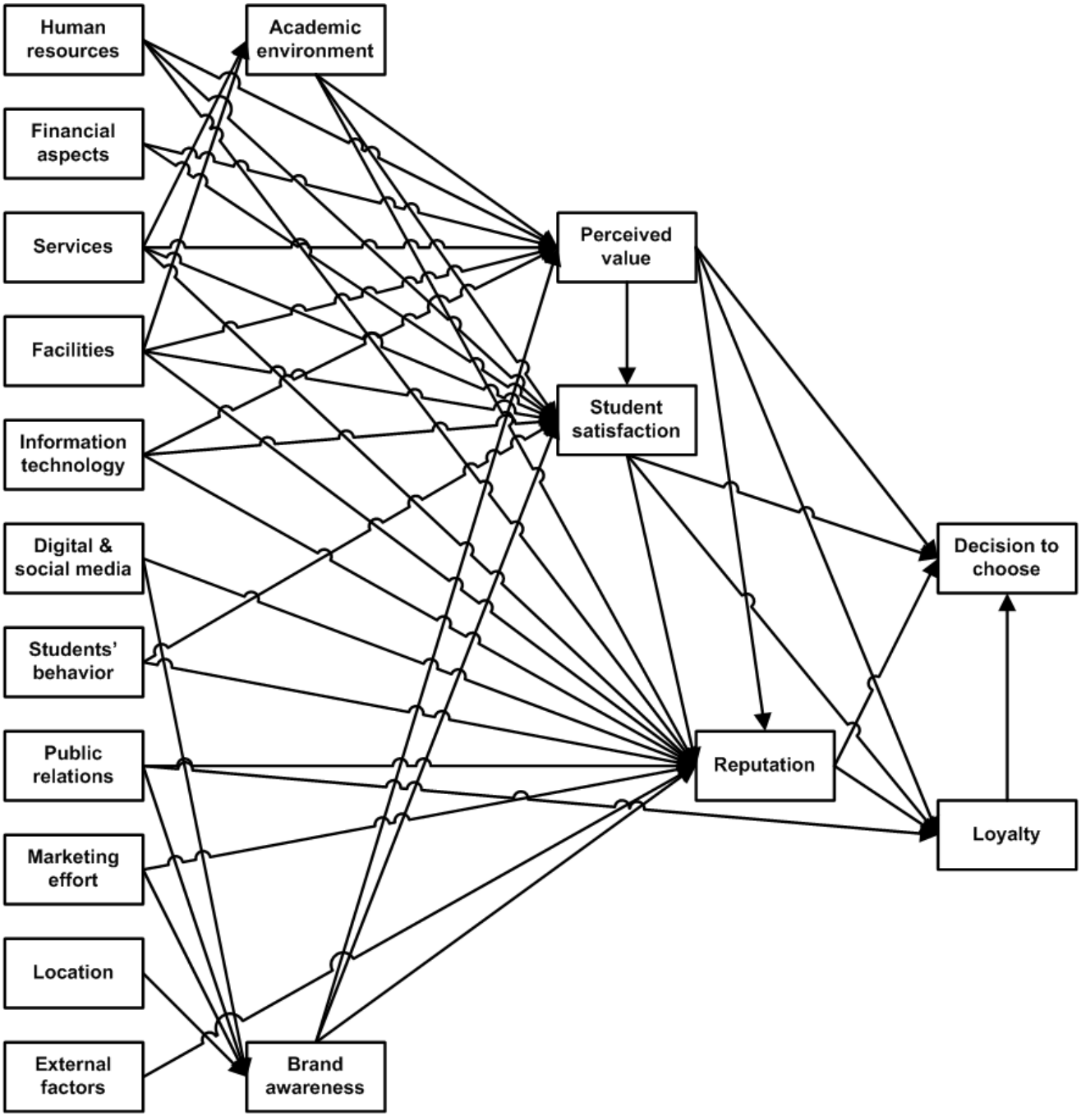
3.3. Outcomes of HEIs Activities and Processes

Outcomes from HEIs processes commonly and recently discussed are academic environment, institution brand awareness, institution perceived value, student satisfaction, institution reputation, stakeholders' loyalty, and stakeholders' decision to choose or recommend the institution. Academic environment is contributed by learning and research environment, physical environment, and emotional environment, that are influenced by stakeholders' intentions and perceptions, and relationship style and quality [39, 43, 49, 50, 53]. Institution brand awareness that can be named as brand identification, brand identity, or brand knowledge is discussed in many studies related to HEIs marketing [24, 26, 27, 38, 39, 42, 43, 46, 47, 51, 53, 54, 55]. Institution perceived value defined in this study covers similar variables from other studies like perceived quality, performance, brand equity, brand experience, value co-creation, academic quality, and brand congruity [22, 23, 24, 27, 39, 41, 42, 43, 46, 48, 53, 54, 55, 56, 57]. Student satisfaction meant in this study covers also terminologies like student feelings and user satisfaction defined in other studies [20, 23, 25, 38, 39, 40, 44, 45, 50, 54, 56, 57]. The next HEIs management outcome is institution reputation, that in other studies named also as image, positioning, brand trust, brand association, credibility, imagery, and trustworthiness [20, 24, 25, 26, 27, 28, 38, 39, 41, 42, 43, 44, 46, 47, 48, 49, 50, 52, 53, 54, 55, 56, 57]. The next HEIs management outcome that is predicted as the impact of other outcomes is stakeholders' loyalty, that in other studies also mentioned as attachment, engagement, and sense of belonging [21, 22, 23, 24, 39, 42, 43, 45, 46, 49, 51, 53, 54, 57]. Another HEIs management outcome believed as the final impact is stakeholders' decision to choose or recommend the institution. It discussed in some studies and named as willingness to recommend, resonance, enrollment intention, repurchase intention, decision to choose, student choice, and preference for college [27, 38, 39, 42, 52, 56].

3.4. Initial Model

Using the variables defined in Part 3.1, an initial model of the multiple relationship among variables can be constructed as illustrated in Figure 1. As the first tier of mediating variables, EV is predicted as a function of SR and FC, while BA is predicted as a function of MD, PR, MK, and LO. The second tier mediating variables, PA, is estimated as a function of HR, FI, SR, FC, IT, and EV, while VA is a function of HR, FI, SR, FC, IT, SB, EV, BA, and PA. The third tier of mediating variable is RP, and it is a function of HR, SR, FC, IT, MD, SB, PR, MK, EX, EV, BA, PS, and SA. The dependent variable, LY, is predicted to be affected by PR, PA, SA, and RP, while DC is affected by PA, SA, RP, and LY.

Figure 1: The Initial Model



4. META-ANALYSES, FINAL MODEL, AND DISCUSSION

The number of studies involved in the meta-analyses is 29, with the number of samples in each study is in the range of 132 to 3,421. The p values of the effect sizes determined in the studies are in the range of 0.00 to 0.06, while the reliabilities (α) of the data measurement of the variables in the studies is in the range of 0.730 to 0.991, exceeding the minimum reasonable α value of 0.5 [58]. For each pairs of variables whose relationships will be analyzed, the number of cases (K) observed from the studies is in the range of 3 to 19 cases, and the total number of samples (N) is ranged from 1,020 to 12,066.

According to Figure 1, there are 43 pairs of variables to be tested. The results of the meta-analyses, as presented in Table 2, show that the 14 pairs have no significant relationship (n.s.), and the other two pairs cannot be concluded because no adequate data (n.a.) can be taken from the 29 studies. Thus, there are 27 pairs of variables that have significant relationships.

Table 2: The Meta-analyses Effect Size Between Variable 1 and Variable 2

Variable 1	**Variable 2**						
	EV	**BA**	**VA**	**SA**	**RP**	**LY**	**DC**
HR			0.342	0.481	n.s.		
FI			n.s.	n.a.			
SR	n.s.		0.398	0.699	n.s.		
FC	0.608		0.561	n.s.	0.583		
IT			0.704	0.621	0.714		
MD		n.a.			n.s.		
SB				0.660	0.750		
PR		0.799			0.177	0.872	
MK		n.s.			n.s.		
LO		n.s.					
EX					n.s.		
EV			0.572	n.s.	0.703		
BA			0.637	0.524	0.655		
VA				n.s.	0.626	0.523	0.259
SA					0.653	n.s.	0.493
RP						0.650	0.480
LY							n.s.

Table 3 shows the data summary of the cases used in the meta-analyses of the 25 pairs of variables which have significant relationships. The α_1 and α_1 are the data reliability of the first variable and the second variable in the pair, respectively.

Table 3: The Meta-analyses Data Summary

Relationship	**K**	**N**	α_1	α_2	**Data Sources**
HR-VA	4	1,676	0.760	0.830–0.920	[39]
HR-SA	4	1,671	0.760–0.867	0.768–0.932	[38, 39, 40]
SR-VA	5	1,508	0.940–0.950	0.960	[23, 43]
SR-SA	9	3,204	0.799–0.991	0.895–0.978	[20, 23, 44, 50]
FC-EV	8	3,512	0.920–0.980	0.930–0.950	[43]
FC-VA	4	1,756	0.920–0.980	0.960	[43]
FC-RP	14	6,012	0.891–0.980	0.865–0.949	[20, 43, 44]
IT-VA	4	1,496	0.901–0.947	0.891	[44]
IT-SA	7	2,717	0.751–0.934	0.895–0.953	[40, 44, 45]
IT-RP	4	1,496	0.799–0.934	0.865	[44]
SB-SA	3	1,472	0.787–0.885	0.768–0.932	[25, 38, 40]
SB-RP	3	1,169	0.787–0.910	0.807–0.900	[28, 38]
PR-BA	6	11,483	0.850–0.956	0.840–0.936	[42, 47, 51]
PR-RP	3	1,076	0.889–0.936	0.824–0.936	[47, 49]
PR-LY	4	10,673	0.889–0.956	0.815–0.885	[49, 51]

Relationship	K	N	α_1	α_2	Data Sources
EV-VA	12	6,830	0.820–0.950	0.830–0.920	[39, 43, 53]
EV-RP	16	12,066	0.820–0.972	0.820–0.987	[39, 43, 49, 50, 53]
BA-VA	12	5,945	0.730–0.960	0.796–0.940	[24, 39, 43, 46, 53, 54, 55, 56]
BA-SA	3	1,020	0.730–0.809	0.768–0.950	[38, 39, 54]
BA-RP	17	10,235	0.730–0.936	0.780–0.940	[24, 38, 39, 43, 46, 47, 53, 54, 55]
VA-RP	19	11,316	0.796–0.940	0.780–0.943	[22, 24, 39, 46, 53, 54, 55, 57]
VA-LY	14	6,937	0.830–0.960	0.820–0.942	[22, 23, 24, 39, 43, 46, 53, 54, 57]
VA-DC	3	1,086	0.920	0.860	[39, 56]
SA-RP	10	3,873	0.768–0.978	0.807–0.987	[20, 25, 38, 39, 44, 50, 54, 57]
SA-DC	3	1,423	0.768	0.738–0.815	[25, 38]
RP-LY	13	8,012	0.780–0.943	0.820–0.942	[24, 39, 43, 46, 53, 54, 57]
RP-DC	4	1,369	0.807–0.910	0.738–0.860	[38, 39, 52]

Table 4 presents the result of the meta-analyses. The d_{meta} is the effect size computed by meta-analysis procedure, σ_d is the standard deviation of d_{meta}, and α_{meta} is the composite reliability of the data included in the computation, after corrected for sampling errors and measurement errors. The feasible relationships are determined based on two criteria, the first is the significance of the effect sizes, and the second is the adequacy of the effect sizes. The significance of the effect sizes is decided based on the ratio of $d_{meta} \div \sigma_d$ that should be greater than 1.96 [58]. The effect sizes are categorized adequate if the value is more than 0.3. As shown in Table 4, the PR-RP and VA-DC relationships should be excluded from the model because their effect sizes are less than 0.3.

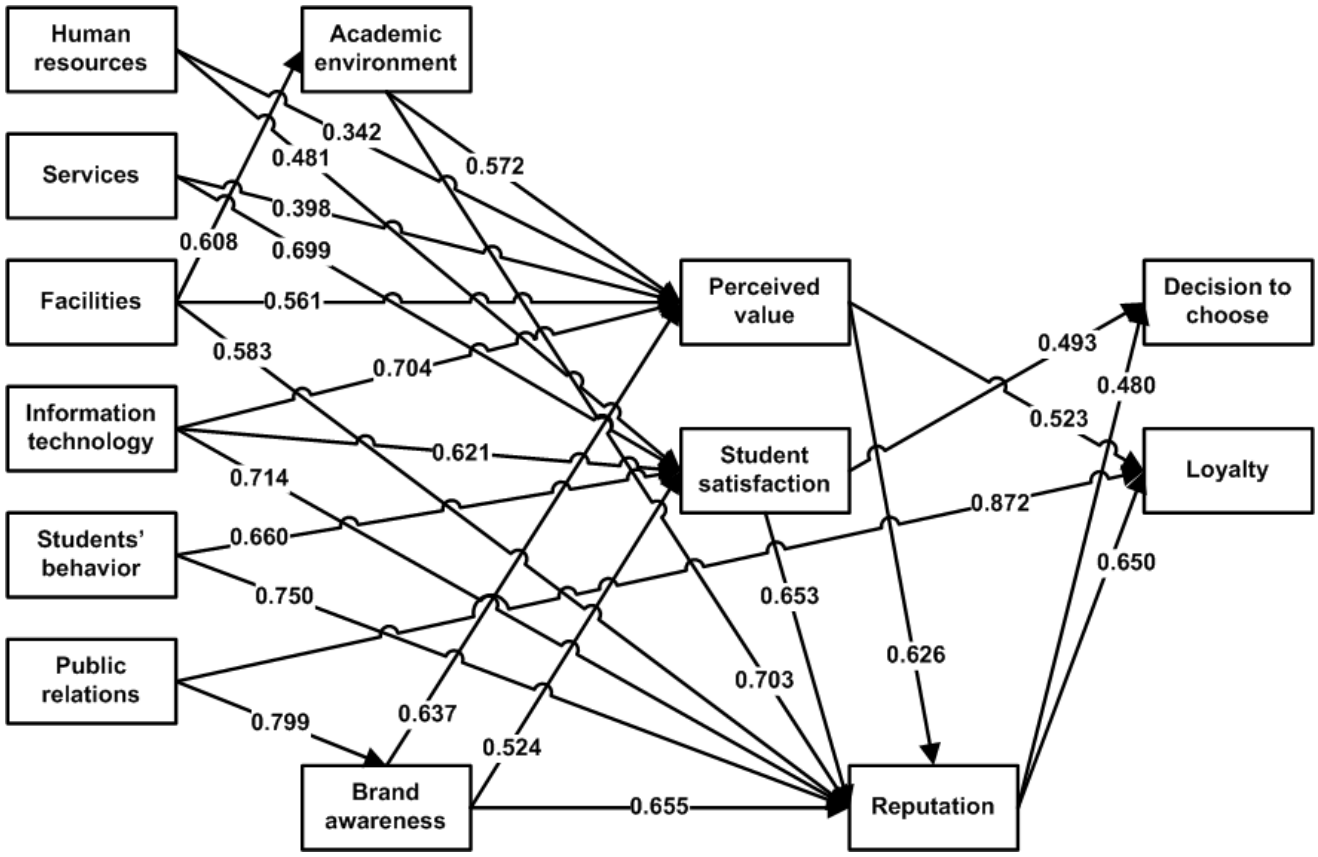
Table 4: The Meta-analyses Results

Relationship	d_{meta}	σ_d	α_{meta}
HR-VA	0.342	0.117	0.826
HR-SA	0.481	0.090	0.836
SR-VA	0.398	0.195	0.952
SR-SA	0.699	0.251	0.909
FC-EV	0.608	0.089	0.944
FC-VA	0.561	0.073	0.954
FC-RP	0.583	0.105	0.927
IT-VA	0.704	0.162	0.910
IT-SA	0.621	0.209	0.889
IT-RP	0.714	0.107	0.871
SB-SA	0.660	0.006	0.839
SB-RP	0.750	0.094	0.867
PR-BA	0.799	0.238	0.920
PR-RP	0.177	0.061	0.907
PR-LY	0.872	0.141	0.899
EV-VA	0.572	0.241	0.893
EV-RP	0.703	0.130	0.887
BA-VA	0.637	0.192	0.838
BA-SA	0.524	0.234	0.827
BA-RP	0.655	0.165	0.842
VA-RP	0.626	0.226	0.883
VA-LY	0.523	0.187	0.901
VA-DC	0.259	0.117	0.889

Relationship	d_{meta}	σ_d	α_{meta}
SA-RP	0.653	0.327	0.918
SA-DC	0.493	0.211	0.772
RP-LY	0.650	0.146	0.886
RP-DC	0.480	0.206	0.817

The results of the meta-analyses show that the 18 constructs in initial model presented in Figure 1 are reduced to 13 constructs. The 5 constructs excluded are financial aspects, digital and social media, marketing effort, location, and external factors. Accordingly, the initial model is revised and the final model is presented in Figure 2.

Figure 2: The Final Model



The financial aspects construct is proven to be not significantly affecting both perceived value and student satisfaction. The four cases included in the analysis bring wide variation of size effect values, from 0.050 to 0.872 so the meta analyses could not conclude the representative value from those data. Around 80% of those data are taken in year 2025-2026, so it can be assumed that today's society's preferences on HE is not affected by financial consideration.

A unique finding is, event people today is in the digital era, the digital and social media construct are not proven to influence the brand awareness and reputation of HEIs. The 17 cases involved in the meta-analysis related to the construct give size effect vary from 0.071 to 0.878. Even the sample analyzed is big enough, more than 10,000, there is no conclusion can be taken. The next construct that relevant to media, marketing effort, shows similar finding. Marketing effort is proven to not significantly affecting the brand awareness and reputation of HEIs. The wide variation of size effect from negative effect -0.001 to 0.842

causes no conclusion can be provided. In other words, digital media, social media, and marketing effort are believed as good weapons to increase brand awareness and reputation in HEIs practices, but findings from studies cannot prove the belief.

The next construct, location, is failed to be proven affecting brand awareness. Study addressing this factor is rare, so even though the samples size is adequate, the number of cases is too small (3 cases) and the variation in the effect sizes from the cases is too wide (0.003 to 0.252). In common sense, location is not a problem anymore in this digital era. The last construct excluded from the model is external factors, that is the factors related to external stakeholders' role. It is also proven to not significantly affect the HEIs reputation, regarding to the wide variation of the effect size from 0.088 to 0.878.

From Table 4 and Figure 2, a general findings can be described in the consecutive paragraphs. Academic environment as the first tier mediating variable is strongly influenced by facilities and cannot be proven to be affected by services. Brand awareness, the other first tier mediating variable, is strongly affected by public relations. The digital and social media and the marketing effort that at first are predicted to affect the brand awareness, is proven not to be by the meta-analyses.

The second tier mediating variable, the perceived value, is influenced by brand awareness, human resources, services, facilities, and information technology. The facilities and information technology give the strongest influence. Once the HEIs' stakeholders aware to an HEI, they will highlight human resources, services, facilities, and information technology provided by the HEI. The other second tier mediating variable, student satisfaction, is aroused by human resources, services, information technology, and the students' behavior themselves. The student feels how the teachers and staffs treat them, how information technology facilitated them (more than physical facilities), and how the students interact one to another. The level of services, the level of information technology, and the situation raised up by students' interaction bring the strongest effects to student satisfaction, more than the teachers and staffs.

The reputation, the highest tier of mediating variable, is determined by brand awareness, facilities, information technology, students' behavior, academic environment, perceived value, and student satisfaction. A reputable HEI must be a known HEI. Furthermore, the value of the facilities, information technology, and academic environment, under stakeholders' perception, that might be influenced by student satisfaction spread by WOM, are affected the reputation of an HEI. The meta-analyses results show that all the effects of the variables to the reputation are strong.

Lastly, brand loyalty and decision to choose or recommend an HEI are the outcomes expected by the HEI. The brand loyalty is strongly developed by public relations, perceived value, and reputation. The excellent public relations that deliver the information of the real values of the HEI, supported by HEI reputation that has been shaped for long time, are a great combination of actions that assure the loyalty of the stakeholders to the HEI. The decision to choose or recommend an HEI is encouraged by student satisfaction and HEI reputation. The strong effect of student satisfaction on the HEI reputation strengthen the effect to the decision to choose or recommend an HEI.

5. CONCLUSION

The previous studies about HEIs management factors mostly are case studies, so that the findings are not general, even contradict one to another, so that the practitioners confuse to use the results. Some studies do generalization through meta-analysis, but still in a limited scope of purpose. To facilitate the gap between previous findings and the needs of HE practitioners, this study performs a series of meta-analyses on the relationships between 43 pairs of 18 constructs developed in an initial model. At the end, the meta-analyses can provide a final model with significant effect sizes between 25 pairs of 13 constructs. The

remaining 18 pairs and 5 constructs are excluded from the model because the variation of effect sizes is too wide or the data is not adequate.

This study affirms that human resources, services, facilities, information technology, student behavior, and public relations are the factors proven to influence academic environment, brand awareness, perceived value, satisfaction, and reputation. Furthermore, academic environment, brand awareness, perceived value, satisfaction, and reputation are partially influencing each other and give effects to loyalty and decision to choose or recommend.

The interesting finding from the meta-analyses is that the media and marketing factors, that in practice are believed as powerful tools to enhance brand awareness and reputation, in this study is found giving no significant effect to brand awareness and reputation of HEIs. The wide variation of the size effects as the cause of this phenomenon can be conceived as an inexactness of the role of marketing and media. They might be powerful or not, depend on how they interact with other factors, for example with the perceived value offering through the marketing and the media.

In the future study, the findings of this study can be sharpened by clustering by year the studies included, so that the results can be used to predict the trend of HE influential factors. Furthermore, clustering the studies based on case location is also interesting to involving cultural aspects.

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