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Exploring the antecedents of institutional effectiveness: a case study of higher education universities in India

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ABSTRACT

The significance of Institutional Effectiveness is pivotal to the functioning of an academic institution. The mushrooming of private institutions in the Indian higher education space necessitates exploring its antecedents to ensure quality higher education is imparted by the institution. The purpose of this research endeavor is to explore the impact of Academic Leadership on Institutional Effectiveness with a mediating role of Campus Culture and Faculty Involvement in Decision Making. The study employed a cross-sectional research design and implemented a purposive sampling technique to collet primary data from 80 permanent faculties and 249 students of private engineering colleges located in the Karnataka state of India. Data was collected through a structured questionnaire and analyzed using Partial Least Square-Structural Equation Modeling. Hypothesis shows academic leadership and campus culture has high influence on institutional effectiveness. Faculty in decision making and campus culture partially mediates between academic leadership and institutional effectiveness. The results of FIMIX-PLS and PLS-MGA analysis shows the similarity in the results of total effect and path relationships. This paper provides theoretical foundations and empirical findings on conceptualizing the antecedents of institutional effectiveness. The outcomes of this research serve as significant input to policy makers and higher education institutions to facilitate enhancement of institutional effectiveness.

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1. Introduction

Research across the world has shown growing concern onthe significance of academic leadership on institutional effectiveness (Banker & Bhal, 2020). The importance of

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academic leadership manifolds due to the drastic increase in the private institutions in India but limited research in this field necessitates the need for further research (Sihotang, 2020). This empirical study attempts to bridge the research gap and authenticates the relevance of academic leadership in private institutions. The importance of Academic Leadership is not only having the best managerial skills in the terms of routine work but also in time administration, self-administration, decision making, impact, and responsibility, along with human skills, a higher degree of mindfulness, greater knowledge towards the necessities of their adherents. Thus, academic leadership plays a vital role in assuring institutional development (Sun et al., 2014). A study entitled 'Efficient Institutional Development' conducted in Europe with eight European Community engaging nations acknowledged that academic leadership could fairly affect students' learning, their results, intermediate outcomes, and school improvement (Creemers & Hoeben, 1998).

It is also documented in the literature that a motivated faculty team play an instrumental role in achieving institutional effectiveness. Highly motivated faculty members contribute to improved institutional effectiveness when they participate in decision making and are given autonomy. This would further lead to improved job satisfaction and also encourages them to put more exertion into achieving their objectives. (Siddique et al., 2011). A review of the literature has presented significant evidence on this school of thought. In a research endeavour undertaken in Singapore, it is attempted to achieve or build skills and traits mandatory for successful leadership; especially, motivational skills, personality traits, and social skills (Ng et al., 2015). The research endeavour have displayed numerous roles of academic leaders, two of which are (i). Leaders of the institution's vision and changes, (ii). Leaders of leadership preparation (David & Andrews, 2014). The mediating role of campus culture and faculty involvement in decision making has been investigated, while it has been demonstrated that can play an important role in enhancing student learning and institutional effectiveness (John-Steiner, 1997).

Research highlights that academic leadership has an impact on persuading institution improvement and student learning (Hopkins & Reynolds, 2001; West et al., 2013). Several department leaders from individual experience have narrated that academic leadership is complicated and highly demanding, with considerable stress, notable burnout, and much more turnover (Brown & Moshavi, 2002). The research confirmed that for curriculum reforms and success, the role of an academic leader is vital (Khan et al., 2015). Davis et al. (2015) have furnished evidence on mediating variable campus culture (CC). There has been a prior study to check the mediation of campus culture between the view of the schoolleadership and school effectiveness. In the presentstudy, the campus culture is considered as a mediating variable which mediates between academic leadership and institutional effectiveness. In this research endeavour, the construct faculty involvement (FI) in decision making is considered as a mediating variable, in addition to campus culturewhich mediates between the academic leadership and institutional effectiveness. Moreover, Bileviciute et al. (2019) suggested that there is a strong nexus between the significance of higher education and the increasing demand for highly qualified and socially responsible people in the labor market. Nayak et al. (2021) highlighted that economic growth is essential for

the sustainable progress of an emerging country, such as India. Moreover, Hawaldar et al. (2019) revealed the significant implications of economic sustainability for the development of India based on economic production and long-term economic growth, but without any negative influence on environmental, social, or cultural aspects.

2. Conceptual framework

Institutional effectivenessis influenced by exogenous latent variables, academic leadership (West et al., 2013), faculty involvement in decision making (Siddique et al., 2011) and campus culture (Shen & Tian, 2012) which is presumed to best explain the outcome or exogenous construct institutional effectiveness (Lindsay, 1982). Nazarko and Šaparauskas (2014) argued that public higher education field is under a growing pressure in order to increase the efficiency and quality of its activities (Figure 1).

2.1. Review of literature

2.1.1. Academic leadership

Academic leadership is just not having better supervisory expertise considering routine work and time, such as: decision making, time management, self-management, commitment, and influence. However, it would also had increased attentiveness,

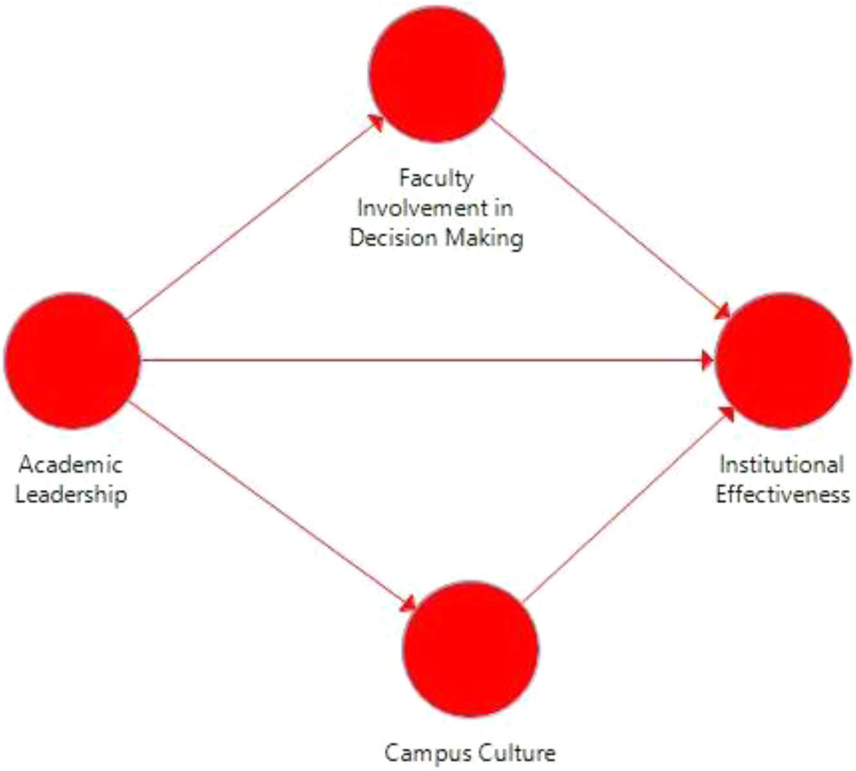

Figure 1. Conceptual framework for Institutional Effectiveness. *Source*: Author's own contribution.

personal skills and abilities, better personal qualifications and examination towards the requirements of their followers (Sun et al., 2014). Academic leadership has a major impact on assuring school development (Hopkins & Reynolds, 2001; West et al., 2013). A case study conducted in Australia on successful school leadership (Gurr & Drysdale, 2012) highlighted the relevance and contribution of the academic leadership to the quality of education in the institution. From an Australian perspective, the academic leader holds an important and significant role in achieving the success of an institution. The quality and nature of the academic leader identified in the study highlighted a consistent and common set of behaviour and personality traits. The relevance of the academic leader's values and his core beliefs represents a relevant research subject. This research subject is uniformly secured in our study, as is the main contribution to the areas of teaching, capacity building, and learning.

An empirical study brought out the fact that the academic leaders attempt to achieve or build skills and traits mandatory for successful leadership; especially, personality traits, social skills, and motivational skills (David & Andrew, 2014). Research has also displayed numerous roles of academic leaders, in that two of which are leaders of institutional vision and leaders of leadership preparation. In ordinary circumstances, at the commencement of an institutional change or reform, the academic leaders consider the institutional setting and partners with key shareholders to define the destinations of the change with the end goal to guarantee it is lined up with the institution's vision. The academic leaders then specifically express the established vision (e.g., by giving motivational speeches) and assisting the significant shareholders in the institution to achieve the goals.

2.1.2. Faculty involvement in decision making

Research has shown that if faculty staff is considered in decision making and given autonomy, the level of job satisfaction would also be enhanced and they would put more effort in achieving their objectives (Siddique et al., 2011). Therefore, the role of academic leadership is to counteract and wipe out dis-satisfiers, regardless of whether internal or external, which will negatively impact the faculty member's self-governance. Inspired faculty staffs can gain global affirmation, an extraordinary picture far and wide, and with this goodwill or brand, educational institutions can draw the smartest students from everywhere throughout the globe and can generate a lot of financial support for research and make a solid impacting culture in their field.

2.1.3. Campus culture

Campus culture comprises of three perspectives, in particular, (i). Material, (ii) Institutional, and (iii). Spiritual culture (Shen & Tian, 2012). Campus material culture regularly escalates against the environment and facility. Institutional culture refers to administer direction framework, administration, and task control and confinement component. Spiritual culture alludes to how campus individuals participate in social exercises and what results are accomplished, consequently mirroring the belief system, values, aesthetic consciousness, and so forth. It incorporates written mental and behaviour culture. The outer image of campus culture is material culture. Institutional culture ensures the methodical advancement of campus culture. The

Centre and soul of campus culture are vested in Spiritual culture. Organizational culture is 'an attribute or quality internal to a group that has a fairly stable set of taken-for-granted assumptions, shared beliefs, meanings, and values that form a kind of backdrop for action'. The campus culture highly impacts the beliefs, sentiments, feelings, and values of students, faculty, and other members. However, the impact of this is not the same for all the individuals who are experiencing the same campus culture but this will give a range of possible outcomes. The study hasgranted information on mediating variable campus culture which plays a role to improve student learning as well as institutional effectiveness (Nguyen et al., 2015). Moreover, Ullal et al. (2021) suggested that Indian customers are more emotional.

2.1.4. Institutional effectiveness

Institutional effectiveness has been described as effectiveness and efficiency. But the interest in effectiveness and efficiency is not often welcomed in the educational field. Some academicians demand that the educational goals are too mysterious, value-based, and intangible for achieving this major objective and therefore it is difficult to measure the effectiveness (Bagonza et al., 2019). The challenges faced by educational institutions are presumably more numerous in the case of current educational environment. The credit-based schedule system of education is more focused on making money, public funding cuts, answerability, students treated as customers, quality assurance, and production support management (Laing & Laing, 2011; Puspitaningtyas & Kurniawan, 2013). Departmental heads who know from their self-experience, usually feel that academic leadership is demanding and complex, with considerable pressure for higher revenue (Brown & Moshavi, 2002). Research assured that for educational update and success, the post of academic leaders was important to succeed (Cheng, 1994). Many studies have been done on the school level. A study entitled on the effective institutional improvement announced that academic leadership could or fairly affect students' learning, intermediate results, and institutional improvement (Creemers & Hoeben, 1998; Scheerens et al., 2001).

In the backdrop of an exhaustive review of literature, the following hypotheses have been proposed:

H1: Academic leadershipis positively associated with faculty involvement in decision making.

H2: Academic leadershipis positively associated with campus culture.

H3: Academic leadership is positively associated with institutional effectiveness.

H4: Campus culture is positively associated with institutional effectiveness.

H5: Faculty involvement in decision makingis positively associated with institutional effectiveness.

H6: Campus culture mediates between academic leadership and institutional effectiveness.

H7: Faculty involvement in decision making mediates between academic leadership and institutional effectiveness.

3. Empirical setting and procedure of testing

This research work is highly focused on institutional effectiveness in an educational field setting to empirically validate the hypothesis formulated. This is primarily due to three reasons: First, academic leadership has a major impact on institutional effectiveness because people differ in their academic leadership style which has its relevance and high impact on institutional effectiveness. Second, campus culture involves the values and beliefs of students, faculties, and other members significantly influence the institutional effectiveness. Third, faculty involvement in decision making enables the faculty team to provide a higher degree of autonomy, job satisfaction, and motivation in order to achieve their objectives, which has an impact on institutional effectiveness. Yet, there is very limited research work on these parameters.

3.1. Sample and data description

Primary data is collected through the structured questionnaire which has been circulated among 80 faculties and 249 students of private engineering colleges located inthe Karnataka state of India. The instrument consists of a non-comparative-detailed rating scale utilizing a 5 point Rensis Likert scale, with 5 – Strongly agree and 1 – Strongly disagree, depending on the type of question (Malhotra & Birks, 2000). The cross-sectional research design is applied in the study. Students who are in their third and fourth year of engineering and thefaculty memberswho are full time and permanent in their rolls are surveyed. The second-generation software namely, SmartPLS-3.0 is used for data analysis. The total sample size is 329. Among the samples, 188 were males and 141 females. About age, 44 percent of the sample is less than 20 years old, 33 percent fall in the bracket of 20 to 30 years age, 16 percent under the age group of above 30 and below 40, only 3 percent of sample range between 40 to 50 and 2 percent are above 50 years of age.

3.2. Measures

The exogenous construct academic leadership was measured reflectively using six indicators drawn on those suggested by Hopkins and Reynolds (2001); and West et al. (2013). This research has also adopted items from Siddique et al. (2011) for the reflective constructfaculty involvement in decision making with three indicators. The campus culture construct with three indicators is drawn on those recommended by Shen and Tian (2012), and the endogenous construct institutional effectiveness with six indicators are conceptualized and operationalized by drawing on scale propounded by Lindsay (1982).

3.3. Testing methods and procedure

PLS-SEM is considered as an appropriate tool for this research work (Hair et al., 2016; Hair et al., 2017), by using the software SmartPLS 3.0 (Henseler et al., 2015). Among the different weighting schemes that the SmartPLS provides for algorithm settings, we have chosen the structural model for a weighing method for conducting the

Table 1. Measurement model evaluation.

Constructs	Indicators	Outer loading	Composite reliability	AVE	Cronbach's alpha	Outer weight	VIF
Academic leadership	AL1	0.792***	0.913	0.679	0.889	0.222***	1.982
	AL2	0.772***				0.203***	2.006
	AL3	0.828***				0.268***	2.453
	AL4	0.870***				0.261***	3.019
	AL5	0.853***				0.257***	2.473
Faculty involvement in decision making	FI1	0.892***	0.883	0.715	0.821	0.456***	1.929
	FI2	0.837***				0.378***	1.715
	FI3	0.806***				0.344***	1.619
Campus culture	CC1	0.939***	0.926	0.806	0.897	0.375***	3.697
	CC2	0.840***				0.317***	2.087
	CC3	0.911***				0.418***	2.808
Institutional effectiveness	IP1	0.719***	0.931	0.694	0.919	0.185***	2.404
	IP2	0.875***				0.218***	3.006
	IP3	0.745***				0.157***	1.944
	IP4	0.849***				0.202***	2.941
	IP5	0.852***				0.209***	2.738
	IP6	0.878***				0.225***	3.273

Note: ***$p<.01$, **$p<.05$ and *$p<.10$.
Source: Author's own contribution.

data analysis. Raw data transformation is chosen to facilitate the incorporation of standardized data for indicators (Hair et al., 2017). To facilitate algorithm convergence, the researchers has chosen the stop criterion of 1.10^{-5}, which is also the threshold value for the purpose. The maximum number of iterations chosen is 300. There are varying rules of thumb that explain whether R^2 values are high or not (Hair et al., 2017). There is no distributional assumption. Therefore, the researchers has conducted a non-parametric test. Accordingly, the non-parametric bootstrapping procedure is required. Therefore, this research work has adopted the following bootstrapping routine:

- The total number of valid samples is 329. 5000 bootstrap samples are invoked to run the PLS-SEM algorithm by following the rule of thumb.
- Empirical t-values and theoretical/critical t-values are compared with each other for the two-tailed test. The critical t-value which is used for comparison is 1.96.
- To obtain the empirical t-values, 'no significant change' option has been adopted
- Bootstrapping confidence intervals are also properly reported.

Composite reliability also is known as internal consistency reliability is considered to be more adequate than Cronbach alpha as the measure of composite reliability doesn't tend to increase the value of reliability along with the addition of every new item. The threshold value of internal consistency reliability should be equal to or greater than 0.8 (Daskalakis & Mantas, 2008) which has been established in the present work.

For a reflective model, the threshold value of path loadings should be above 0.7 (Henseler et al., 2012). The threshold value of outer loadings of all indicators is above 0.7 (Table 1). This indicates that the indicators of all constructs have acceptable levels of outer loading. The Average Variance Extracted (AVE) is a strongly recommended test (Naylor et al., 2012) to measure convergent validity. Convergent validity is

measured with the AVE threshold value should be more than 0.50 (Wasko & Faraj, 2005; Wixom & Watson, 2001). In an acceptable model, the threshold value of AVE should be greater than 0.5 (Chin, 1998; Höck & Ringle, 2006). AVE values of all constructs are above the threshold value of 0.5 (Table 1). Therefore, there exists convergent validity in all exogenous and endogenous latent constructs of all measurement models.

PLS is a better way to measure the discriminant validity (Wasko & Faraj, 2005). To measure the discriminant validity the square of the correlations among the variables has been in contrast with the AVE (Chin, 1998). Fornell and Larcker (1981) criterion is the best way to measure the discriminant validity which is a comparison between the square root of AVE and other latent variables. The above criterion, by the Fornell-Lecker criterion, is considered by researchers to be conservative in assessing discriminant validity (Hair et al., 2017). The amount to which a given construct of the model is different from other constructs (Chin, 1998; Hair et al., 2017; Fornell & Larcker, 1981; Wasko & Faraj, 2005).

The collinearity levels among constructs of the study are tested. The collinearity levels are tested by the Variance Inflated Factors (VIF) guidelines. All predictor variables showed VIF levels below 5.00 (Table 1). This means the collinearity is not a problem in the structural model of the study. This study adopted the blindfolding procedure to calculate the predictive relevance of the model. Blindfolding represents an operation to use samples repeatedly by the omission of every 7th data point of the data set of endogenous constructs. This procedure is adopted for only those endogenous constructs that have measurement specification of the reflective type. The blindfolding process calculates the parameter estimates to assess predictive relevance i.e., Q^2.

The following algorithm settings are ensured while running the blindfolding procedure in the current research endeavour:

- The number of observations applied in the model evaluation i.e., 329 divided by the omission distance D.
- Accordingly, the number 7 is used to denote the omission distance. Thus, the direction of prior work (Hair et al., 2017), on blindfolding procedure, that the omission distance should remain between 5 and 10, is ensured.

This study has used the cross-validated redundancy method to calculate the Q^2 value which is a gauge of the predictive relevance of the model with a value larger than zero (Hair et al., 2017). Hair et al. (2017) suggested computing the Stone-Geisser's Q^2 value (Geisser, 1974; Stone, 1974) for understanding the model's predictive relevance. It gives us an idea regarding how good the path model is in predicting the values that we have originally observed. After running the blindfolding procedure, this study arrived at the values of Q^2 (Table 2). All values of Q^2 are above zero, which indicates that the model of this research endeavour has predictive relevance. As the prior research suggests (Hair et al., 2017), Q^2 values show the efficiency with which the path model demonstrates the predictability of values that we originally observe in the model.

FIMIX-PLS is mandatory when the data are not alike. It is necessary for segmentation into groups as part of the study (Hahn et al., 2002; Ringle et al., 2010; Sarstedt et al., 2011). When unobserved heterogeneity is suspected then applying FIMIX is

Table 2. Hypothesis testing and f^2 and q^2 effects.

Relationships	Path coefficient	t – value	Bias corrected 95% confidence interval	f^2	q^2
Academic leadership-Faculty involvement in decision making	0.743***	26.475	(0.682, 0.791)	Not Defined	Not Defined
Academic leadership-Campus culture	0.744***	30.842	(0.692, 0.786)	Not Defined	Not Defined
Academic leadership-Institutional effectiveness	0.358***	10.360	(0.286, 0.422)	0.341	0.438
Campus culture-Institutional effectiveness	0.626***	16.743	(0.553, 0.701)	0.913	0.189
Faculty involvement in decision making-Institutional effectiveness	0.006	0.129	(−0.080, 0.090)	0.000	0.000

Note: ***$p<.01$, **$p<.05$ and, *$p<.10$.
Source: Author's own contribution.

necessary. If the researcher fails to employ FIMIX when it must lead to sufficient inaccuracy while analyzing the results. FIMIX-PLS segments investigation is established on heterogeneity in the inner path model. Application of FIMIX-PLS to assess cumulative models, like ones based on the confirmed standard plan, to assure that calculated results are not influenced by unobserved heterogeneity in the inner path estimates.

A parametric multi-group analysis is popularly known as multi-group analysis, is applied to independent samples t-tests to correlate paths between groups (Keil et al., 2000). Group 1 represents the student status and Group 2 represents the faculty status.

4. Empirical results

4.1. Evaluation of measurement and structural model

The evaluation of the reflective model includes avalidation of outer loading, composite reliability, Cronbach's alpha, AVE, outer weight, and variance inflated for are validated in this model (Table 1). The Fornell-Lecker criterion, (Chin, 1998; Hair et al., 2017; Fornell & Larcker, 1981; Wasko & Faraj, 2005) is the best method to measure the discriminant validity. The discriminant validity values in these reflective constructs, i.e., academic leadership is 0.824, campus culture is 0.898, Faculty involvement in decision making is 0.846 and institutional effectiveness is 0.833 shows discriminant validity has been established (Figure 2).

The path value and empirical t-value of the first four hypotheses are above the threshold value of 0.20 and 1.96 respectively, substantiate the hypothesis. But in the case of the fifth hypothesis i.e., association between faculty involvement in decision making and institutional effectiveness the path value and empirical t value are below the threshold value, reject hypothesis 5. There are varying rules of thumb that explain whether R^2 values are high or not (Hair et al., 2017). Prior research (Hair et al., 2017) states that the cut-off values of 0.25 are weak, 0.50 are moderate and, 0.75 are treated to be high respectively in other studies. All three exogenous constructs explain 86.2% of institutional effectiveness ($R^2 = 0.862$).

As the prior research suggests Q^2 values show the efficiency with which the path model demonstrates the predictability of values that we originally observe (Hair et al., 2017). The Q^2 of endogenous construct institutional effectiveness is 0.562 which is above zero, which indicates that the model of this research endeavour has predictive relevance.

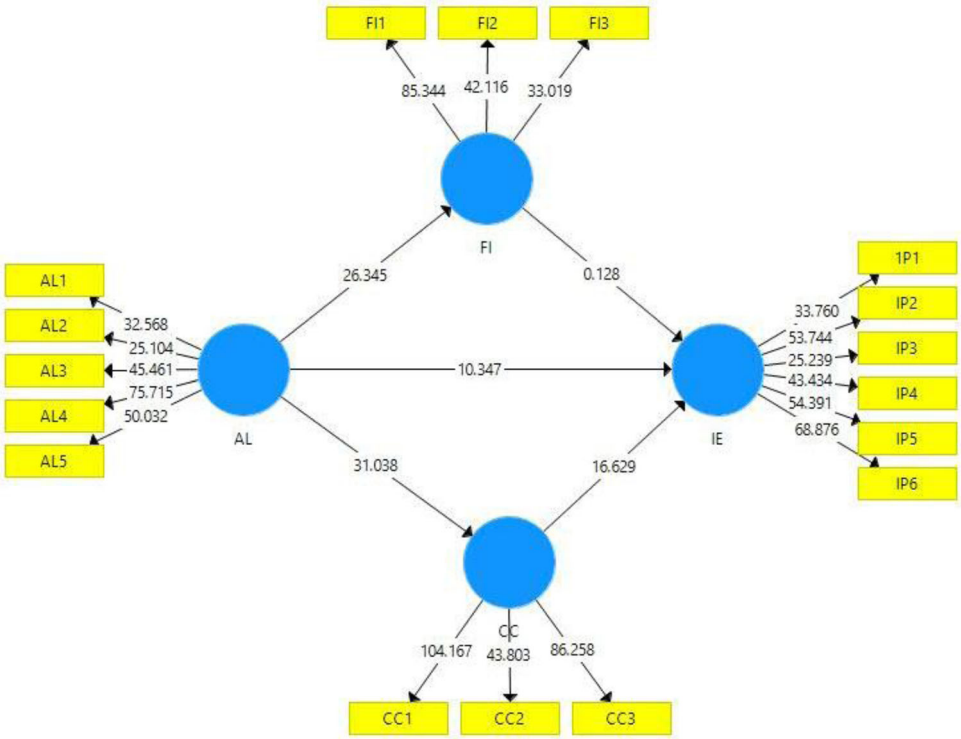

Figure 2. Structural model of Institutional Effectiveness. *Source*: Author's own contribution.

The f^2 effect size of the independent variables was calculated after the calculations relating to R^2 value, p-values, t-values, and bootstrap confidence intervals. We also calculate the q^2 effect size, which explains the 'relative impact of predictive relevance' (Hair et al., 2014). The rule of thumb that the prior research advocates, to decide upon the importance of the effect size f^2 andq^2, state that the effect size values of 0.35 havea large effect, 0.15 has a medium effect and 0.02 has small effect sizes respectively (Cohen, 1988). From the above calculation, the f^2 effect size of the impact of academic leadership oninstitutional effectiveness and campus culture on institutional effectiveness has a large effect except for faculty involvement in decision making on institutional effectiveness which does not affect. The q^2 effect size of the academic leadership on institutional effectiveness has a high effect whereas, campus culture on institutional effectivenesshas a medium effect. But faculty involvement in decision making on institutional effectiveness does not affect. Model fitness is measured with the SRMR (Standardized Root Mean Square Residual) criteria fit (Henseler et al., 2014). The greatest fit arises when SRMR values are zero. A good fitness threshold value is less than 0.08 (Hu & Bentler, 1998). In this research work, the SRMR value is 0.074 indicates good fitness of the model.

4.2. Evaluation of mediator analysis

There are three mediator effects in this research work which have a definite procedure to analyze the effect of mediating variables namely campus culture and faculty

Table 3. Effect of mediation construct.

	Direct effect	Indirect effect	Total effect	VAF	Mediation
Figure 3	0.361***	0.468***	0.829***	56.4%	Partial
Figure 4	0.590***	0.240***	0.830***	28.9%	Partial
Figure 5	0.358***	0.470***	0.828***	57.5%	Partial

Note: ***$p<.01$, **$p<.05$ and *$p<.10$ (two-sided test).
Source: Author's own contribution.

involvement in decision making between academic leadership and institutional efectiveness (Klarner et al., 2013). In the case of the first mediator effect, campus culture mediates between academic leadership and institutional effectiveness. Academic leadership's indirect effect via campus culture on institutional effectiveness (0.468) is significant and also its direct effect on institutional effectiveness (0.361) is also significant. With the VAF values, 56.4% campus culture partially mediates between academic leadership and institutional effectiveness relationship.

In the second mediator effect, faculty involvement in decision making mediates between academic leadership and institutional effectiveness. Academic leadership's indirect effect via faculty involvement in decision making on institutional effectiveness (0.240) is significant (Table 3). The direct effect on institutional effectiveness (0.590) is also significant. With the VIF value, 28.9% of the faculty involvement in decision making partially mediates between academic leadership and institutional effectivenessrelationship. In both mediator effects, the VAF value is above 20% and below 80% (Hair et al., 2017).

Finally, in the third combined mediator effect jointly considers both constructs (i.e., faculty involvement in decision making and campus culture) in the model (Figure 3) suggests that academic leadership's direct effect on institutional effectiveness (0.358) remains significant. Furthermore, the indirect effect via faculty involvement in decision making and campus culture (0.470) is significant witha VAF of 57.5%. Joint consideration of faculty involvement in decision making and campus culture partially mediates the relationship between academic leadership and institutional effectiveness.

4.3. Importance – performance matrix analysis

The important performance matrix analysis (IPMA) gives us an idea regarding the relative importance and performance of exogenous constructs in their relationship with the endogenous construct. The total effects of exogenous constructs represent their importance, while their index values represent their performance. Importance reveals the complete overall effect on the final endogenous variable in the path diagram. The performance reveals the capacity of the latent variable scores. More precisely, the IPMA contrasts the total effects, representing the predecessor constructs' importance in shaping a certain target construct, with their average latent variable scores indicating their performance (Fornell et al., 1996; Martilla & James, 1977; Slack, 1994).

On the X-axis, 'Importance' is measured which reveals the total effect. If the total effect of any construct is higher than other constructs then that construct is more significant. On the Y-axis, 'Performance' is measured and if a construct has a higher

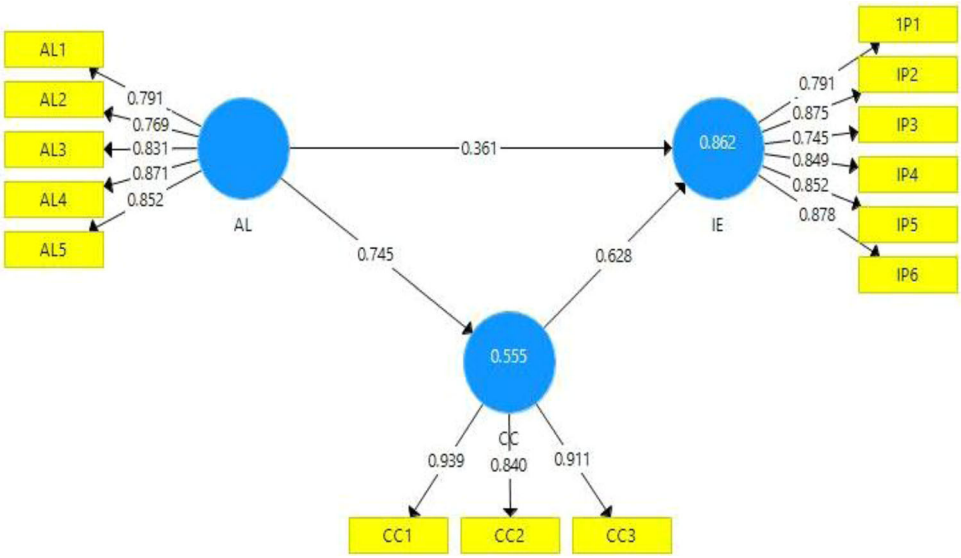

Figure 3. Effect of mediating construct campus culture. *Source*: Author's own contribution.

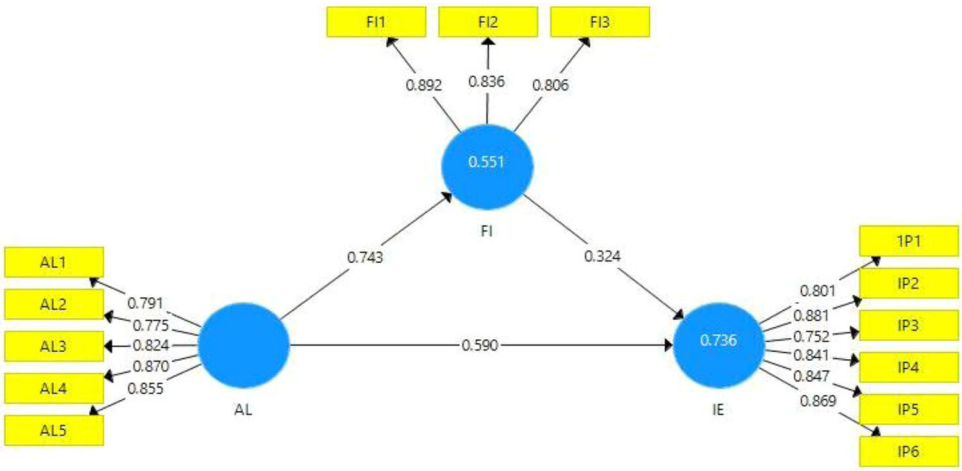

Figure 4. Mediating effect of faculty in decision making. *Source*: Author's own contribution.

mean value then that construct has a higher performance which reflects solid measurement paths (Hair et al., 2014; Hock et al., 2010; Rigdon et al., 2011; Schloderer et al., 2014; Völckner et al., 2010). The IPMA of the exogenous constructs of this study is given in Figure 6 (Table 4).

IPMA analysis (Figure 6) shows that Academic leadershiph as a high performance of 32.484 in comparison with the other exogenous latent variables. On the other hand, with the total effect of Academic leadership is 0.828 which is specifically high. Thus, a one-unit increase in Academic leadership performance from 32.484 to 33.484 would increase the performance of Institutional Effectivenessby 0.828 points from 26.025 to 26.853. The total effect and performance of exogenous latent construct

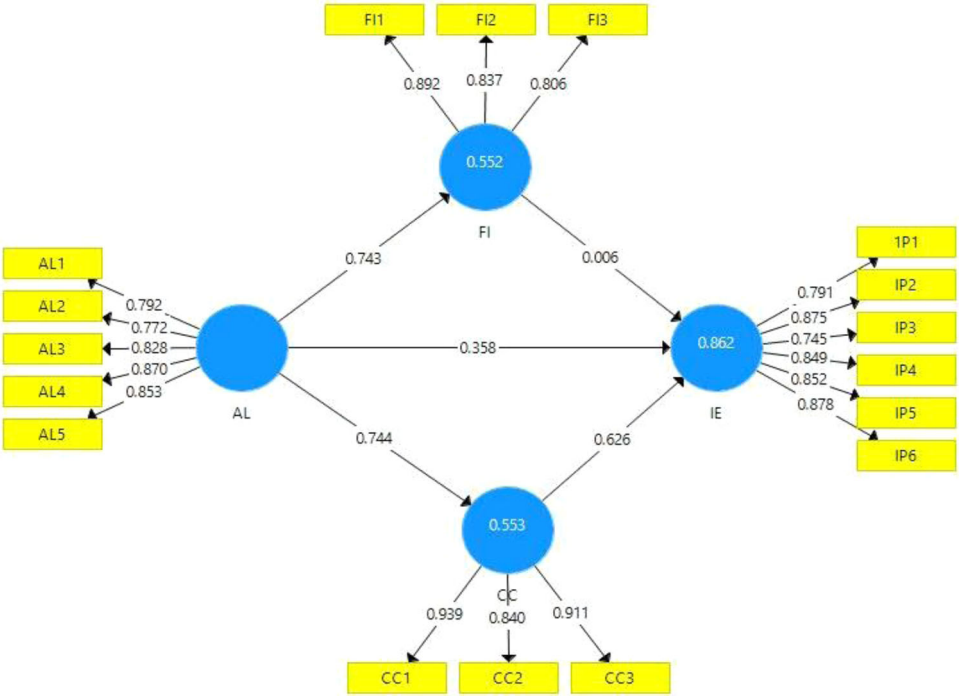

Figure 5. Mediating effect of the full model. *Source*: Author's own contribution.

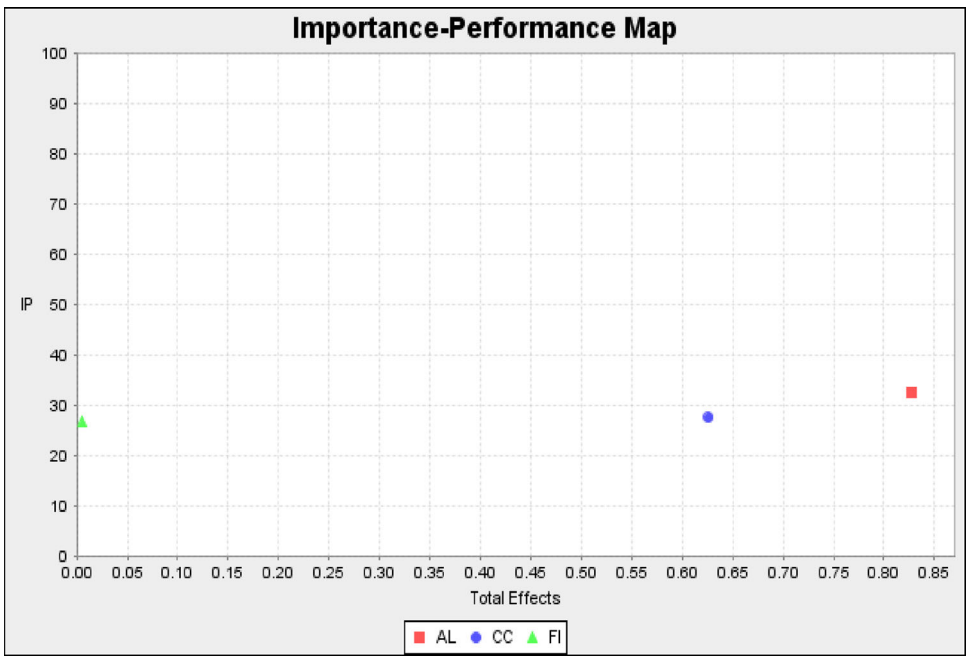

Figure 6. Importance performance matrix analysis. *Source*: Author's own contribution.

Table 4. Importance performance matrix analysis of Institutional Effectiveness.

	Institutional effectiveness	
Latent constructs	Importance (Total effects)	Performance (Index values)
Academic leadership	0.828	32.484
Campus culture	0.626	27.552
Faculty involvement in decision making	0.006	26.624

Source: Author's own contribution.

Table 5. FIMIX-PLS solutions for segmentation.

Relative segment size						Number of pre-specified segments				
	S1	S2	S3	S4	S5	Quality criteria	S = 2	S = 3	S = 4	S = 5
S = 2	57%	43%				AIC	**1,498.647**	1,391.001	1,299.836	1,249.815
S = 3	62%	28%	10%			AIC3	**1,515.647**	1,417.001	1,334.836	1,293.815
S = 4	57%	31%	8%	4%		AIC4	1,532.647	1,443.001	1,369.836	1,337.815
S = 5	59%	23%	9%	5%	4%	BIC	**1,563.180**	1,489.698	1,432.698	1,416.842
						CAIC	**1,580.180**	1,515.698	1,467.698	1,460.842
						HQ	1,524.391	1,430.374	1,352.839	1,316.447
						MDL5	1,957.312	2,092.488	2,244.147	2,436.948
						LnL	−732.323	−669.500	−614.918	−580.908
						EN	**0.594**	0.758	0.811	0.846
						NFI	0.637	0.744	0.779	0.798
						NEC	133.620	79.610	62.063	50.749

Source: Author's own contribution.

campus culture are 0.626 and 27.552 respectively. Thus, a one-unit increase in campus culture performance from 27.552 to 28.552 would increase the performance of Institutional Effectiveness from 26.025 to 26.652. Similarly, the total effect and performance of exogenous latent construct Faculty involvement in decision making are 0.006 and 26.624 respectively. This would increase the performance of Institutional Effectiveness from 26.025 to 26.031. The latent endogenous Institutional Effectiveness variable mostly generates a GoF outcome that is only moderate. The EN of 0.594 for segment 2 strongly supports the choice of two groups for a priori data segmentation. So AIC, AIC3, BIC and CAIC are significant in segment 2.

4.4. FIMIX-PLS and multi-group analysis

To overcome invalid interpretation there need the absence of heterogeneity (Becker et al., 2013; Jedidi et al., 1997). At the same time because of Hypothesis 5, we verify the unobserved heterogeneity. There are various methods of uncovering unobserved heterogeneity with the help of PLS-SEM. FIMIX-PLS (Hahn et al., 2002; Hair et al., 2016; Matthews et al., 2016) is the most appropriate approach (Hair et al., 2017; Sarstedt et al., 2011) (Tables 5 and 6).

There are methods of uncovering unobserved heterogeneity with PLS-SEM. FIMIX-PLS (Hahn et al., 2002; Hair et al., 2016; Matthews et al., 2016; Sarstedt et al., 2011). There is a need to avoid local optimum solutions (Sarstedt et al., 2011). While BIC, AIC, AIC3, and CAIC have a fair over-segmentation tendency (Sarstedt et al., 2011) there is a need for a two-segment solution. The normed entropy (eN) criterion, which evidentially shows the finestresult with 2 segments (0.594).

Table 6. Uncovering unobserved heterogeneity through FIMIX-PLS.

	Relations	1st segment	2nd segment	|Δ12|	t-value Students[MGA]	t-value Faculty[MGA]
Relative segment size		0.57	0.43			
Path coefficient	AL-CC	0.447***	0.923***	0.476	28.594***	17.656***
	AL-FI	0.453***	0.945***	0.492	27.660***	8.026***
	AL-IP	0.448***	−0.026***	0.422	10.278***	4.164***
	CC-IP	0.496***	0.890***	0.394	16.660***	12.229***
	FI-IP	−0.019	0.138	0.119	0.447	0.086
R^2	CC	0.200	0.853			
	FI	0.205	0.894			
	IP	0.626	0.988			
Total effects	AL-CC	0.447	0.923	0.476	28.594***	17.656***
	AL-FI	0.453	0.945	0.492	27.660***	8.026***
	AL-IP	0.661	0.927	0.431	53.475***	21.297***
	CC-IP	0.496	0.890	0.394	16.660***	12.229***
	FI-IP	−0.019	0.138	0.119	0.447	0.086

Note: ***$p<.01$, **$p<.05$, *$p<.10$.
Source: Author's own contribution.

The large and small segment shows significantly different PLS-SEM results. About the association between academic leadership and campus culture is much stronger (0.923) in segment 2 in comparison with segment 1 (0.447). The relationship between academic leadership and faculty involvement in decision making much stronger (0.945) in segment 2 when compared with segment 1 (0.453). The relationship between campus culture and institutional effectiveness (0.890) is higher than Segment 1 (0.496). However, construct the relationship between academic leadership and institutional effectiveness segment 1 is stronger (0.448) compared to segment 2 (-0.026). In contrast, the relationship between faculty involvement in decision making and institutional effectiveness is not at all significant in both Segments.

The total effects show that academic leadership has less significant in Segment 1 comparatively with Segment 2 (0.923) in relationship with campus culture. Academic leadership has a higher impact on faculty involvement in decision making (0.945) in segment 2 than segment 1 (0.453). However, the total effect also reveals that in the relationship between academic leadership and institutional effectiveness (0.927) as well as between campus culture and institutional effectiveness (0.890) has a higher impact in segment 2 when compared to segment 1. In contrast, the relationship between faculty involvement in decision making and institutional effectiveness is not significant in both Segments. Segment 2 has higher R^2 values for campus culture (0.853), faculty involvement in decision making (0.894), and institutional effectiveness (0.988).

For the demographics data, the cross-table analysis can be used to identify applicable descriptors (Ringle et al., 2010). It has been found that only the student and faculty aspect of demographic features shows a good fit. The two groups under demographic features are students and faculty groups. Table 7 shows the results of group-specific PLS-SEM. It also shows their differences. PLS multi-group analysis helps to understand the importance of difference through a double bootstrap routine (Sarstedt et al., 2011).

The analysis shows that the two segments are specific. Academic leadership determines faculty involvement in decision making in the student segment (0.786) ismuch higher than the faculty segment (0.625) at a 5 percent significant level. Similarly,

Table 7. Multi-group analysis.

	Path	Students	Faculty	|Δ|
N		0.566	0.434	
Path relation	AL-CC	0.786	0.703	0.83
	AL-FI	0.786**	0.625**	0.161**
	AL-IP	0.395**	0.211**	0.184**
	CC-IP	0.624	0.757	0.133
	FI-IP	−0.023	−0.006	0.029
R^2	CC	0.618	0.495	0.123
	FI	0.618**	0.391**	0.227**
	IP	0.895*	0.835*	0.060*
AVE/CR	AL	0.934/0.739	0.840/0.522	
	CC	0.946/0.854	0.845/0.660	
	FI	0.899/0.747	0.818/0.604	
	IP	0.935/0.706	0.932/0.698	
Total effects	AL-CC	0.786	0.703	0.083
	AL-FI	0.786**	0.625**	0.161**
	AL-IP	0.867***	0.740***	0.127***
	CC-IP	0.624	0.757	0.133
	FI-IP	−0.023	−0.006	0.017

Note: ***$p<.01$, **$p<.05$ and *$p<.10$.
Source: Author's own contribution.

Academic leadership determines institutional effectiveness is stronger in the student's segment (0.395) compared to the faculty segment (0.211) at 5 percent significant level. Conversely, Academic leadership on campus culture, faculty involvement in decision making on institutional effectiveness, and campus culture on institutional effectiveness play no significant role in both segments.

The R^2 values for faculty involvement in decision makingare considerably higher (0.618) compared to the faculty segment (0.391) at 5 percent level of significance. However, on construct institutional effectiveness R^2 values is relatively higher in the student segment (0.895) when compared with the faculty segment (0.835) at one percent significance. But for campus culture, the R^2 values are not significant in both segments.

The total effects justify the path relationship results. In the student's segment, academic leadership helps highly to institutional effectiveness, constituting the greatest (0.867) influence when compared with the faculty segment (0.740) at 10 percent significance. Similarly, in the student's segment, academic leadership making contributes, higher to faculty involvement in the decision (0.786) compared to the faculty segment (0.625) at 5 percent significance. In contrast, the relationship between academic leadership on institutional effectiveness, campus culture on institutional effectiveness, and faculty involvement in decision making on institutional effectiveness plays no significant role in both segments.

5. Conclusions and discussion

This research paper has significant managerial implications. It contributes to our understanding of the empirical validity of the assumptions of the impact of academic leadership, faculty involvement in decision making, and campus culture on institutional effectiveness. The impact of academic leadership on institutional effectiveness is neither high like campus culture nor low like faculty involvement in decision

making. So there is a need to pay more attention towards the construct academic leadership and its parameters like the following:

a. Academic leaders should depute and sponsor, faculty for National/International Seminars/Conferences/faculty development programs;
b. the proper vision and goals of an academic leader can improve the institutional effectiveness and it also shows that the professional developments of faculties should be prioritized when the academic leader needs to facilitate the institutional effectiveness;
c. Academic leaders must analyze and use data to establish specific goals and strategies aimed at improving institution achievement and growth.

In this research paper, it is evident that the mediating variable campus culture showed a partial mediation between academic leadership and institutional effectiveness indicate that the construct campus culture has a significant role in facilitating institutional effectiveness. The campus culture differs from institute to institute, campus culture is that which effectively and deliberately connects with differing individuals, thoughts, and viewpoints to make energetic learning and workplace. This is achieved by supporting and propelling endeavours to build up a pervasive culture of inclusion in all facets of life at the institution. So to facilitate the institutional effectiveness the academic leaders should get to know about the campus culture and how the campus culture will improve their institution's performance because the campus culture is not a standardized variable to be ideal for all the institutions. So it is very important that the academic leaders to improve the campus culture to boost up the institution's performance by the following:

a. The institute should provide the students with good recreational facilities like playground, gymnasium, amphitheatre, allied sports facilities, etc.;
b. The institute should provide good cultural and sports activities;
c. The institute should provide library that has sufficient textbooks, references, magazines, and journals as per AICTE norms.

Since total effects substantiate the path relationship the results of the total effect of PLS-MGA are similar to that of the path relationship. Therefore, this research endeavour has significant managerial implications that educational institutes need to pay more attention to the student's segment without ignoring the faculty segment since there exist no much differences in values. This empirical research paper has minor limitations. In the present research, IPMA infers linear relationships one could target on nonlinear relationships in the future work (Anderson & Mittal, 2000; Eskildsen & Kristensen, 2006; Mittal et al., 1998). There might be alternative moderating or mediating construct such as leadership preparation (Brundrett & Crawford, 2012; Hallinger & Heck, 1998) that might influence the institutional effectiveness formation process. Moreover, while this research analyzed the impact of academic leadership, faculty involvement in decision making and campus culture on institutional effectiveness in respect of educational institutes, it widens an avenue to explore, in a

detailed comparative study, whether the impact of academic leadership, faculty involvement in decision making and campus culture on institutional effectiveness relationships between premium institutes and University system differ in strength.

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