Research article

Academic autonomy as driving change: Investigating its effect on strategy development and university performance

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A R T I C L E   I N F O

A B S T R A C T

There has been an ongoing theoretical argument on the role of Academic autonomy (AA) in improving the ability of public universities to develop strategies and enhance their performance. This study aims to investigate whether AA impacts strategy development (SD) and University performance (UP). Moreover, it investigates the effect of SD on UP. The present study uses a resource-based view to demonstrate the links among constructs. This study employed a survey method, and data were collected from 130 leaders of Indian public universities utilising a non-probability purposive sampling technique. Data was analysed using Partial least squares structural equation modelling (PLS-SEM). The results revealed that AA positively and significantly affects SD. Moreover, the results demonstrated that AA directly affects both UP's dimensions: research and teaching performance. The results also showed that SD directly and positively affects both UP's dimensions, research, and teaching performance. In line with these findings, several implications for theory and practices are addressed for university management.

1. Introduction

In higher education literature, University autonomy (UA) is considered a prerequisite for survival [1]. Further, it is seen as an instrument of universities' self-governance [2] that promotes universities' performance [3]. However, UA is regarded as a complex and multidimensional concept [4]. UA originates with four basic dimensions developed by Estermann et al. [5]: academic, financial, organisational, and staffing autonomy. UA is described as "the power of the institution to manage its internal affairs without undue external influence" [6].

Academic autonomy (AA) is emphasised as a principle and lifeblood of universities [7]. AA is characterised by the capacity of universities to regulate student admissions, introduce and terminate various programmes, develop and design degree programmes' content, and select mechanisms and providers of quality assurance [8].

Scholars argue that autonomy is a key factor in improving universities' capability to develop strategies [9–11]. According to Pruvot and Estermann [8], greater AA involves the freedom of universities to set their strategies intended to improve academic aspects such as attracting talented students, boosting research outcomes, and enhancing teaching quality.

Despite AA has been known to be essential for improving universities' UP [12,13], there was very little empirical evidence available concerning the effect of AA on UP [14,15]. This gap highlights and emphasises the need for research to address the AA-UP relationship

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in the context of public universities. Hence, the current study attempts to address this gap by examining whether UP is affected by AA in the context of Indian public universities.

While the theoretical assumption that AA plays a pivotal role in improving the SD capability of universities has been extensively addressed in existing literature [16–19], no studies were identified on whether AA affects SD. Addressing this gap enriches the higher education literature by providing empirically grounded insights into the relationship between AA and SD. Therefore, the current study explores the AA-SD relationship to fill this gap.

Previous empirical works that have investigated the effect of SD on performance are predominantly built on governmental agencies' context [20,21]. Nevertheless, Higher education (HE) literature lacks coherent empirical works on the impact of SD on UP. Bridging this gap contributes to the broader field of higher education research by offering evidence-based perspectives on the relationship between SD and UP. Therefore, the current study intends to understand SD's role in enhancing the UP of public universities [22], specifically in the context of Indian universities.

In order to address the research gaps mentioned above, this study addressed the following research objectives.

1. To empirically examine the effect of AA on UP and its dimensions (research and teaching performance).
2. To empirically examine the effect of AA on SD.
3. To empirically examine the effect of SD on UP and its dimensions (research and teaching performance).

In the following section, the paper presents the literature review and the development of hypotheses. This is followed by a detailed explanation of the chosen methodology for sampling and data collection. Subsequently, the study presents the data analysis and results. The discussion segment critically analyses these results, offering insights into their theoretical and practical implications and broader significance. Finally, the paper concludes by addressing its limitations and suggesting directions for future research.

2. Literature review and the hypotheses development

2.1. Academic autonomy and university performance

AA is a significant pillar of UP of public universities in the long run [13]. For instance, it is articulated that AA is an essential component of the academic discipline [23] to create, innovate and disseminate knowledge [24]. Existing literature suggests that AA gives universities the capacity to shape their internal academic structure to cope with the evolving needs of the public and realise academic excellence in teaching and research [6,25,26]. For instance, Aksnes et al. [27] emphasise that academic autonomy is an influential organisational characteristic for universities that foster UP. Moreover, Woelert et al. [28] concluded that AA is generally linked to a degree of freedom, which can be considered essential for the realisation of better academic performance. On the contrary, some authors argue that AA leads to internal conflicts and alienation among academicians, negatively influencing universities' UP [29]. According to Hayat et al. [30], UP refers to "the extent to which a teacher or institution has reached their respective educational goals". In addition, UP is defined as "the outcome of education" [31].

There are various ways to measure UP (e.g., research, teaching, management, financial performance) [32]. The current study describes UP as "the overall outcomes of universities' teaching and research over the past three years".

Despite what has been written on the vital role of AA in teaching and research-enhancing, empirical studies are limited [33,34] and lack a more holistic view [35]. A recent work by Belgaroui and Hamad [15] has attempted to examine the effect of AA on UP in one public university in Tunisia. It suggests that a considerable level of AA leads to a constructive influence on UP. Building on these arguments cited above, the present study proposes the following hypotheses.

Hypothesis 1.   AA has a positive and significant effect on UP.

Hypothesis 1a.   AA has a positive and significant effect on research performance.

Hypothesis 1b.   AA has a positive and significant effect on teaching performance.

2.2. Academic autonomy and strategy development

AA is described as "the freedom of an institution to run its own affairs without direction or influence from any level of government" [36]. In previous literature, there is some theoretical explanation of the link between AA and SD, such as AA has positive results on driving strategic planning behaviour of public universities [37]. Mainly, AA is considered a basis for them to profile themselves strategically [13,38,39]. According to the literature, AA allows universities to determine how to develop [40,41] and design strategies in order to achieve their goals and objectives [11,42]. For instance, Jarernsiripornkul and Pandey [43] found that AA IS a crucial part of the character of universities by which they enjoy a broader space of action in planning their academic affairs, as they do not need approval for any academic affairs from the external authorities. Moreover, Parakhina et al. [44] reason that the level of success of the universities' strategy development practices is affected by the level of academic autonomy. Likewise, recent studies argue that a high level of AA given to universities strengthens their abilities to develop strategies and shape a unique profile in teaching and research [45]. Thus, it can be said that the universities' strategic abilities to develop strategies largely depend on AA [8]. Additionally, academic research points out that AA provides leaders of public universities with the necessary capacity and competency to make strategic decisions [46]. This also serves as an instrument for carving out niches [47]. Hence, based on these arguments and prior literature, the

present study proposes that.

Hypothesis 2. AA has a positive and significant effect on SF.

2.3. Strategy development and university performance

SD is described as "developing alternative courses of action for goal accomplishment" [48]. The purpose of developing strategies in the private sector is to overperform rivals in the marketplace. Conversely, the public sector focuses on enhancing performance and delivering better services to the public [49]. The development of the university strategy with a niche-focused approach reinforces the connection between values and actions, fostering problem-solving [50,51] and is ultimately linked to better UP [52].

Previous studies on the link between SD and performance in private organisations and public agencies [53–55] provide inconsistent results [20]. Some studies have found that performance is statistically associated with SD [56,57] while other studies have not supported this association [58]. Despite the contradictory empirical evidence from those organisations, it is generally acknowledged that less focus has been on SD in higher education institutions (HEIs) [59].

Studies in the HEIs context have noted that an effective SD is a key to superior UP if effectively executed [60,61] since SD intends to establish strategies to achieve the goals and objectives of the universities [62]. Although there was a long debate on the role of SD in enhancing universities' UP, studies that examined the relationship between SD and UP are scarce, especially in the context of public universities in India. Hence, this study proposed the following hypotheses.

Hypothesis 3.   SD has a positive and significant effect on UP.

Hypothesis 3a.   SD has a positive and significant effect on research performance.

Hypothesis 3b.   SD has a positive and significant effect on teaching performance.

3. Theoretical base

The resource-based view (RBV) is used as the theoretical base in this study to hypothesise the impact of AA on both SD and UP. Also, it is used to explain the impact of SD on UP.

RBV opines that tangible resources, intangible resources, and personal-based resources concert to create organisational capabilities [63]. These capabilities enable organisations to assemble, combine and distribute resources and develop strategies to improve their performance [64,65]. In academic discussions, the RBV is a widely influential theoretical perspective [66] that has been used as a foundation for examining the relationship between autonomy and performance [67]. The assumption is that effectively leveraging the AA of universities as a critical resource [68] will allow them to improve their SD capabilities [41,69,70] so that they can achieve better performance [71].

Considering the application of the RBV to the Strategic management field, J. B. Barney [64] claimed that organisations can improve their performance by using the existing resources to develop and execute strategies that use their internal strengths while balancing external threats and evading external weaknesses. Based on this, the current study argues that effective use of the universities' resources produces proper strategies to achieve superior OP.

Despite a considerable amount of literature using the RBV in autonomy-performance studies as well as strategy-performance research in the context of for-profit organisations, there is little research using the RBV in the context of HEIs. Drawing on RBV assumptions, this study tests whether both SD and UP are affected by AA. Also, it examines the effect of SD on the performance of Indian public universities (Fig. 1).

4. Sampling and data collection

A survey method of seeking information at the organisational level is used to collect the data with a non-probability purposive sampling technique. This technique helps obtain specific information from participants with expertise and knowledge, which aligns with the objectives of this study [[72], p. 102]. We approached academic leaders in higher administrative roles in the selected universities. The respondents were chosen based on their expertise, role and involvement in academic policies, strategic decisions, and performance of the public universities. Such input is crucial for understanding the relationship between AA, SD and UP. Also, only one leader from each public university was invited to participate in this survey. The questionnaire was sent to 271 leaders via email, jointly
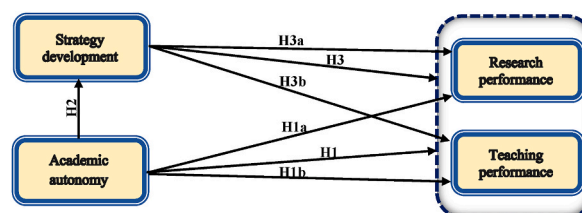

Fig. 1. The research model.

with drop-off and pick-up techniques, to increase the response rate. This resulted in the return of 130 questionnaires, where the response rate was 47.9%, which is considered good [73]. It can be seen from Table 1 below that the respondents represent the higher echelons of the university system, with maximum numbers having a minimum of 15 years of work experience and are designated Professors with administrative roles of Head of Departments (HOD) or above.

4.1. Measurements instrument

A comprehensive literature review was done to design the survey instrument. The survey questionnaire, comprising 22 items, was adopted from previous studies to measure the constructs of this study, using a five-point response scale ranging from strongly disagree (1) to strongly agree (5).

A five-item scale was taken from Pruvot and Estermann [8] to measure AA. For estimating SD, a scale that includes nine items was taken from Segars et al. [74], Bailey et al. [75] and Elbanna [76]. UP was estimated by a scale comprised of 8 items, out of which four items measure research performance and the other four items measure teaching performance. This Scale was taken from Cameron [77], Chen et al. [78], and Asif and Searcy [79].

According to Fornell and Larcker [80], confirming the constructs' validity and ensuring the scale's reliability is crucial. Thus, the current study assessed the scale's validity for each of the constructs before initiating the data collection. First, face validity was confirmed by five experts in the subject matter. These experts were provided with information about the scope and objectives of the current study. Based on their feedback, only minor modifications were made in order to ensure that all the questions were clear and simple to understand. Following that, the questionnaire was sent back to the group of experts, and they all confirmed the relevance of the questions measuring the study's three constructs—AA, SD, and OP. Also, the questionnaire items were identified as generally straightforward and uncomplicated to answer. Second, a pilot test was conducted to ensure that there were no difficulties for the respondents and to assess whether the questions were valid and reliable before administering the final questionnaire [81]. The questionnaire was distributed to 25 respondents with characteristics similar to the target respondents who were deans or heads of departments in Indian public universities, as suggested by McNabb [82]. Cronbach's alpha was used to estimate the data's reliability and internal consistency. The results showed that the values of Cronbach's alpha of AA, SD, and UP constructs are 0.715, 0.869, and 0.911, respectively, which are above the cut-off value of 0.7, indicating that the instrument is valid and the questionnaire can be administered. The operationalised constructs employed in the current study are presented in Table 2.

4.2. Common method bias

In a questionnaire-based study, common method bias (CMB) is a concept of considerable scholarly concern [83]. The current study used the Full collinearity test to detect the potential of CMB, as Kock and Lynn [84] recommended.

The results of the VIF test present that the values of AA, SD, and UP constructs are 1.056, 1.180, and 1.166, respectively, which are under the critical value of 3.3. This indicates that the model of the current study is not contaminated by CMV [85].

4.3. Non-response bias

In cross-sectional studies, non-response bias (NRB) is a subject of noteworthy academic concern [86]. Hence, NRB was assessed to detect whether early and late respondents systematically answered the survey's questions [87]. Following Armstrong and Overton's [88] guidelines, this study applied the independent-sample *t*-test to compare early and late groups of respondents. The results suggest that there is no significant difference between the two groups' answers. This implies that NRB is not a substantial concern in the current study.

Table 1
Demographic characteristics of the respondents.

Constructs	Categories	Frequencies	Percentages
Gender	Male	111	85.4
	Female	19	14.6
Years of Experience	10–15 years	8	6.2
	More than 15 years	122	93.8
Administrative role	Dean	40	30.8
	Assistant Dean	17	13.1
	Director	6	4.6
	HOD	67	51.5
Designation	Professor	110	84.6
	Associate Professor	14	10.8
	Assistant Professor	6	4.6
Total		130	100

Table 2
Cronbach's alpha values of the constructs.

Constructs	No of items	Cronbach's Alpha
University Autonomy	5	0.715
Strategic Development	7	0.869
University Performance	8	0.911

5. Data analysis and results

5.1. Statistical methods

The data were analysed using PLS-SEM through SmartPLS 4 to investigate the relationships of the model [89]. The grounds for using the PLS-SEM stand for the following reasons. Firstly, the study was set to test the study's theoretical framework from a prediction perspective to explain the causal relationship between AA, SD and UP. Secondly, the model of this study includes one formative construct, which is UA, where PLS-SEM allows the analysis of this construct as compared to CB-SEM, which does not entertain such a construct [90]. Thirdly, this study is based on an organisational level; thus, PLS-SEM is recommended as an appropriate technique [90]. Fourthly, this study uses ordinal scales based on a five-point Likert, where the violation of normality is a concern in Likert scale-based research [91]. Therefore, PLS-SEM is preferred as it provides higher robustness in such violations [92] compared to CB-SEM, which requires that data be normally distributed [90]. Finally, this study takes data from a population of deans of schools and heads of departments in Indian public universities that is smaller in number. Thus, PLS-SEM is statistically robust in analysing small sample sizes [93].

5.2. Assessment of measurement model

5.2.1. The assessment of reflective constructs' measurement model

Based on the guidelines suggested by Hair et al. [90], the reflective constructs' measurement model was evaluated using Factor loadings, MacDonald omega (ω), Cronbach's alpha (α), Composite reliability (CR), Dijkstra and Hensler's rho_A (rho_A), and Average Variance Extracted (AVE). As depicted in Table 3 and Fig. 2, the factor loadings of all the reflective constructs' items range between 0.929 and 0.640, which is above the minimum threshold value of 0.5 [94,95]. The derived values of ω, α, CR, and rho_A are observed to be above the critical value of 0.708 and not overreaching the maximum critical value of 0.95 [96,97]. The AVE values of all the constructs are above the cut-off value of 0.50 [98]. Accordingly, convergent reliability is established for the reflective constructs.

The discriminant validity of the reflective constructs was evaluated using the Fornell & Larcker criterion in conjunction with the Heterotrait-Monotrait ratio (HTMT). In assessingFornell & Larcker's [99] criterion, the results exhibit that the square root of the AVE value for each construct placed on the diagonal side exceeds its correlation with other constructs (see Table 4). This means that each reflective construct in the model is distinct from the others. Concerning the HTMT ratio of both reflective constructs, the results demonstrate that the HTMT value is 0.477, which is lower than the maximum critical value of 0.85 [100]. This presents that each reflective construct in the model is distinguishable from the others (see Table 5). Hence, the discriminant validity of the constructs used in the model is well established.

Table 3
The measurement Model of reflective constructs (Source: PLS Algorithm).

Coding	Statements	Loading
Strategy development (α = 0.900, ω = 0.828., CR = 0.920, rho-A = 0.936, AVE = 0.624)		
SD1	We develop annual Objectives	0.842
SD2	We assess the internal and external environment of our university	0.834
SD3	We achieve a good fit between the external environment and the internal capabilities of our university	0.791
SD4	Our university has instructions and written guidelines to develop its strategic plan	0.698
SD5	We meticulously assess many alternatives when deciding on a strategy	0.862
SD6	Our university's strategies emerge gradually as the university responds to the need to change	0.835
SD7	Our university's process and outputs of strategic planning are formally documented	0.640
University performance (α = 0.877, ω = 0.918., CR = 0.842, rho-A = 0.897, AVE = 0.890)		
RP1	Number of research publications conducted by our university	0.903
RP2	Number of research projects obtained by our university	0.929
RP3	The percentage of our university's faculty attending conferences and seminars	0.866
RP4	Number of our university's faculty are on editorial boards of major journals in the field	0.860
TP1	The number of our university's faculty members who receive awards for teaching	0.831
TP2	The average subjects per course offered by our university	0.713
TP3	Number of new courses offered by our university	0.853
TP4	Number of courses incorporating new technology introduced by our university	0.777

Notes: **α**-Cronbach Alpha; **ω**-McDonald's omega; **rho_A**-Dijkstra and Hensler's rho_A –; **CR**-Composite Reliability; **AVE**-average variance extracted.
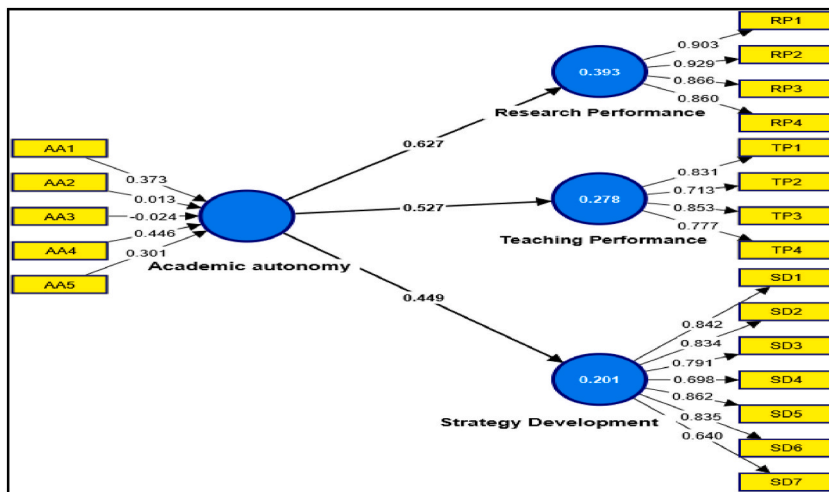
Fig. 2. The measurement model of reflective constructs (source: PLS algorithm).

Table 4
Fornell-larcker criteria.

No	Constructs	1	2
1	University performance	0.943	
2	Strategy development	0.436	0.790

Table 5
HTMT.

No	Constructs	1	2
1	University performance		
2	Strategy development	0.477	

5.2.2. The assessment of formative construct's measurement model

Following the guidelines proposed by Jarvis et al. [101], AA was assessed as a formative construct due to its uncorrelated indicators. Hence, the formative measurement construct was assessed using convergent validity, collinearity (VIF), and weights' statistical significance, as suggested by Hair et al. [90].

The convergent validity was assessed by conducting the redundancy analysis. A single global item (SGI) (used as a dependent variable) was created that captures the overall essence of AA (used as an independent variable), where their path coefficient should be above 0.70 [98,102]. The results indicate that the path coefficient of AA with SGI is 0.675 (see Fig. 3.), which is lower than the prescribed critical value of 0.70 [90,103]. Accordingly, the redundancy analysis was assessed using the percentile method through the bootstrapping technique with 5000 subsamples. The results yield a lower bound LCI of 95 % confidence interval of 0.584 and an upper bound UCI value of 0.783. The estimated point of 0.675 between AA and SGI falls within the upper and lower bounds and does not statistically differ from 0.70. This indicates the establishment of the formative construct's convergent validity.

The indicator collinearity of the outer values of indicators was diagnosed through the variance inflation factor (VIF). The results in Table 6 propose that the values of outer VIF were below the limit value of 5.0. This implies that multicollinearity is not a serious issue [103].
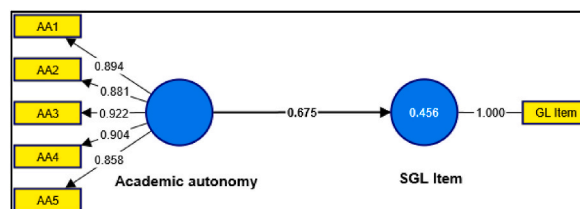

Fig. 3. The redundancy analysis (Source, PLS-SEM analysis).

Table 6
The measurement model of the formative construct.

Statements	Weights	t-values	p-values	Loadings	t-values	p-values	VIF
Our university has the capacity to decide on overall student numbers	0.373	2.144	0.032	0.900	17.106	0.000	3.274
Our university has the capacity to select students (at UG, and PG levels)	0.013	0.069	0.945	0.811	9.612	0.000	3.031
Our university has the capacity to design the content of degree programmes	−0.024	0.106	0.915	0.871	15.727	0.000	4.708
Our university has the capacity to select quality assurance mechanisms	0.446	2.380	0.017	0.919	22.034	0.000	4.047
Our university has the capacity to select the providers of quality assurance	0.301	1.913	0.056	0.882	15.333	0.000	2.615

The statistical significance and relevance of the indicators' weights and loadings were assessed. The results suggest that two of the formative items' outer weight values were significant and relevant. In contrast, the outer loadings of the remaining three items were investigated and observed to be above the limit value of 0.5 (See Table 6). All were found significant, presenting their essential contributions to the AA [90].

5.3. Assessment of structural model

5.3.1. Hypothesis testing
The bootstrapping technique with the recommended 10000 subsamples was used to estimate the hypotheses of this study through β coefficients, t-value and p-value [104].

The results in Table 7 and Figs. 4 and 5 demonstrate that AA has a positive and significant effect on UP (β 0.612, t-value 9.504, p < 0.000). Hence, the first hypothesis (H1) is supported. Similarly, the results suggest that AA has a positive and significant effect on research performance (β 0.627 t-value 9.955, p < 0.000). Thus, the H1a hypothesis is supported. Besides, the analysis reveals that AA has a positive and significant effect on teaching performance (β 0.527, t-value 8.428, p < 0.000). Hence, the H1b hypothesis is supported.

In addition, the results exhibit that AA has a positive and significant effect on SD (β 0.449, t-value 4.756, p < 0.000). Hence, the second hypothesis (H2) is supported. The results indicate that SD positively affects UP (β 0.441 t-value 4.121, p < 0.000). Thus, the third hypothesis (H3) is supported. Moreover, the results indicate that SD positively and significantly affects research performance (β 0.420 t-value 4.372, p < 0.000). Thus, the H3a hypothesis is supported. Likewise, the results present that SD significantly and positively affects UP (β 0.441 t-value 4.121, p < 0.000). Thus, the third hypothesis (H3) is supported.

5.3.2. The model's explanatory power
In this study, the coefficient of determination (R^2) along with the predictive relevance (Q^2) were used as measures to assess the model's in-sample explanatory power [105].

As depicted in Table 8, the results suggest that the SD's R^2 value is 0.206, indicating the model's low explanatory power [106]. Further, the results show that the Q^2 value is 0.330, implying the model's small predictive relevance. Moreover, the UP's R^2 value is 0.375, indicating the model's low explanatory power [106]. Also, the results present that the Q^2 value is 0.336, indicating the model's medium predictive relevance [90].

5.3.3. The structure model's predictive power
In this study, the PLS$_{predict}$ procedure was employed with 10 folds and 10 repetitions according to Shmueli et al.'s [107] guidelines in order to estimate the out-of-sample predictive power of the study's model.

As shown in Fig. 6 below, the endogenous variables' prediction error distribution in the PLS-SEM model is not normally distributed. Hence, the Mean Absolute error (MAE) statistic was used to compare the prediction errors of PLS-SEM (MAE) with linear model (LM) benchmarks MAE.

The results show that the majority of PLS-SEM (MAE) values were found to be less than LM benchmarks (MAE) values. This implies moderate to high predictive power to AP of public universities in India. As a rule of thumb, if prediction error values in PLS-SEM MAE are lower than in LM MA. This suggests that the model of this study has high predictive power [107].

In a comparison of PLS-SEM MAE prediction errors with LM MAE prediction errors via this procedure. In Table 9, it can be observed

Table 7
The structural model's Outcomes.

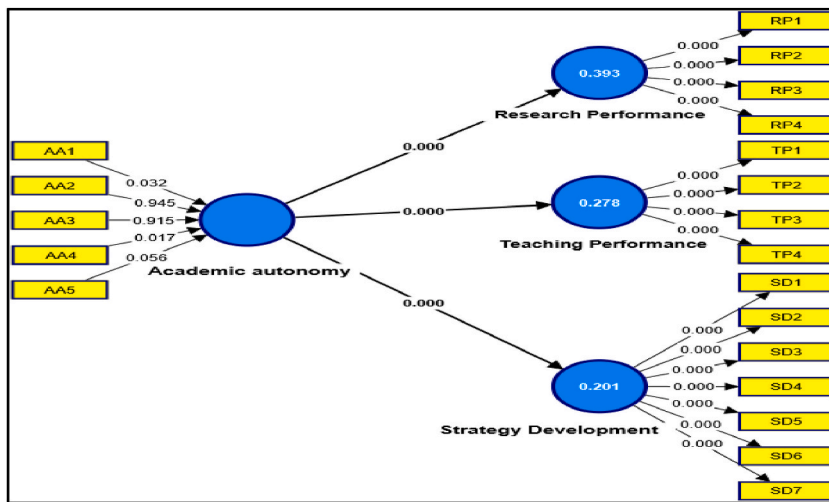| Hypo	Path	β	t-value	p-value	CI		Decision
					2.5%	97.5%	
H1	AA - > UP	0.612	9.504	0.000	0.485	0.738	Supported
H1a	AA - > RP	0.627	9.955	0.000	0.502	0.750	Supported
H1b	AA - > TP	0.527	8.248	0.000	0416	0.666	Supported
H2	AA - > SD	0.449	4.756	0.000	0280	0644	Supported
H3	SD- > UP	0.441	4.121	0.000	0.242	0.642	Supported
H3a	SD- > RP	0.420	4.372	0.000	0.247	0.609	Supported
H3b	SD- > TP	0.428	3.966	0.000	0.228	0.633	Supported

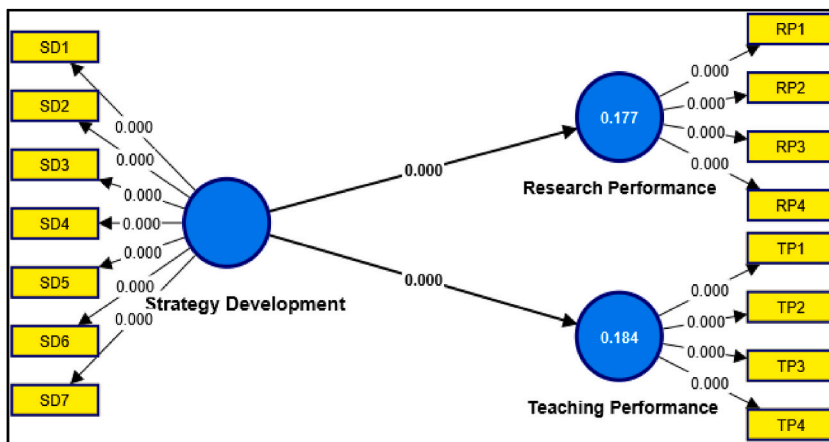**Fig. 4.** Structural model (PLS-SEM Bootstrapping).

Fig. 5. Structural model (PLS-SEM Bootstrapping).

Table 8
The in-sample explanatory power of the model.

Construct	R^2	R^2 adjusted	Q^2
SD	0.206	0.200	0143
UP	0.375	0.370	0.336

that the majority of SD and UP indicators in PLS-SEM MAE prediction errors are lower than the prediction error in LM MAE. This implies that the model of this study has medium predictive power in measuring the SD and UP of Indian public universities.

6. Discussion and conclusion

In this study, several objectives were set to extend the existing HEIs literature by exploring the collective effect of AA on both SD and UP. Moreover, it examined the effect of SD on UP using PLS-SEM with data from public universities in India.

The first objective was to investigate whether UP and its specific dimensions, namely research and teaching performance, are affected by AA. As hypothesised, the findings suggest that UP is positively and significantly influenced by AA, supporting hypothesis H1. This underscores the critical role that AA plays in shaping the overall performance of public universities, which is similar to the prior studies [6,13,25]. Similarly, the empirical findings demonstrate that AA positively and significantly affects both research and teaching performance, supporting hypotheses H1a and H1b. These results align with earlier research highlighting the multifaceted contributions of AA, not only to overall UP but also in the specific domains of research and teaching [15]. Hence, these findings
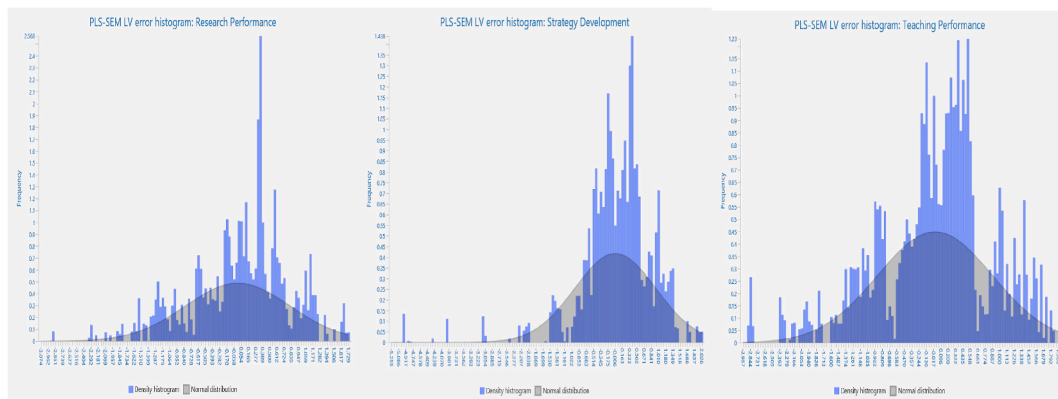
Fig. 6. The prediction error distribution of the endogenous constructs.

Table 9
The predictive power of the structural model.

Items	$Q^2_{predict}$	MAE		PLS-SEM-LM
		PLS-SEM	LM	
SD1	0.138	0.628	0.662	−0.034
SD2	0.073	0.707	0.712	−0.005
SD3	0.049	0.698	0.705	−0.007
SD4	0.016	0.629	0.645	−0.016
SD5	0.169	0.562	0.589	−0.027
SD6	0.158	0.514	0.543	−0.029
SD7	−0.013	0.778	0.789	−0.011
RP1	0.358	0.477	0.471	0.006
RP2	0.328	0.564	0.554	0.010
RP3	0.216	0.557	0.571	−0.014
RP4	0.19	0.706	0.722	−0.016
TP1	0.229	0.717	0.717	0.000
TP2	0.065	0.553	0.576	−0.023
TP3	0.184	0.64	0.656	−0.016
TP4	0.088	0.657	0.669	−0.012

emphasise the need for granting complete AA to public universities as a key driver of enhanced performance of public universities.

The second objective was to explore whether SD is affected by AA. The study's results support hypothesis 2, proposing that AA affects SF positively and significantly. This finding is in line with the theoretical perspectives offered by Bladh [42], Iwinska and Matei [11] and Maassen et al. [13]. According to those scholars, AA empowers universities to determine how to develop strategies designed to achieve their academic goals and objectives. This finding underlines the crucial role of AA in enabling universities to chart their strategic courses proactively, which is essential for universities to navigate the complexities of the contemporary higher education landscape [71].

The third objective was to examine whether UP and its dimensions, namely, research and teaching performance, are affected by SD. As was hypothesised, the findings indicate that UP is positively and significantly affected by SD, supporting hypothesis H3. Similarly, the findings show that SD affects both research and teaching performance positively and significantly, supporting hypotheses H3a and H3b. These results resonate with prior research by Ref. [57]. This finding underlines the critical role of SD in improving UP if effectively executed [60,61], as the essence of SD resides in establishing strategies to achieve the goals and objectives of universities [108].

This study expands the relevant literature with unique theoretical contributions addressing critical gaps. First, the results of this study reveal how AA affects the UP of public universities. Second, the findings of this study also enrich the higher education literature by demonstrating the direct effect of AA on SD. Third, this study also determines how SD affects UP in public universities. Finally, this study contributes to higher education literature by utilising the fundamental theoretical principles of the RBV to investigate how AA can promote SD capacity and lead to superior UP.

The current study has important implications for higher education policymakers as well as leaders of public universities. First, the findings strongly emphasise the benefits of granting a high level of AA to achieve superior UP [71]. Second, the findings suggest that public universities armed with higher levels of AA will strengthen their SD capacities [109]. Finally, the finding of this study also encourages public universities to improve their capacities in developing strategies, which will lead to improving their performance.

7. Limitations and future research directions

Despite attempting to minimise limitations from a methodological perspective, the current study bears some limitations. First, this study used a rather small sample size. Therefore, future studies should incorporate a large sample size in order to validate the current results.

Second, the current study's results may be attributed to selection bias owing to the selection of purposive sampling. Therefore, future studies should consider using other sample techniques. Third, this study applied a cross-sectional design, which may limit its results since it may have common method bias issues. Therefore, future studies may use longitudinal data. Finally, future studies should explore the effect of AA on UP by including new mediators (e.g., Institutional Leadership, the commitment of faculty and staff, Administrative Efficiency, and collaboration with industry), which would provide additional insights.

Data statement

Research data is available upon request. To request the data, contact the article's corresponding author.

CRediT authorship contribution statement

Abdullah Yahia Al Gharsi: Writing – review & editing, Writing – original draft, Software, Methodology, Formal analysis, Data curation, Conceptualization. **Fozi Ali Belhaj:** Writing – review & editing, Writing – original draft, Supervision, Resources, Methodology, Funding acquisition. **R. Nirmala:** Writing – review & editing, Supervision, Methodology, Conceptualization.

Declaration of competing interest

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