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Hurdles on the Way to Sustainable Development in the Education Sector of China

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Abstract: Globally, sustainable procurement is seen as a crucial component of public sector sustainability initiatives. This research investigates the internal and external barriers to the implementation of sustainable procurement in China's public sector. Primary data for this research were gathered using survey techniques from 287 respondents who were procurement officials at higher education institutions that are part of the public sector. Twelve hypotheses were developed based on the conceptual model and literature review and evaluated using SEM-AMOS in order to look at the correlations between the variables. The study's findings demonstrate that employee competency, employee motivation, training programs, financial aspects, management commitment, government rules and regulations, unavailability of green products, supplier capacity, and third-party pressure statistically influence the sustainability of public procurement. At the same time, green practices, the ineffectiveness of green products, and prices of green items had statistically no significant influence on sustainability in public procurement. This is a crucial effort to identify the factors that influence sustainable purchasing in China's public colleges. This study draws interest from stakeholders and adds to the scant body of knowledge on sustainability in developing nations. In addition, this research is crucial for creating a roadmap for China's long-term sustainable development in the area of procurement.

Keywords: sustainable procurement; public sector universities; structural equation modelling; China

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1. Introduction

Due to its significant proportion of global government spending, the role of public procurement in sustainable development has become a focus of research and discussion in recent years [1]. Sustainable supply chains in emerging economies are thought to rely heavily on sustainable procurement [2–4]. Public procurement has a large potential to impact the market in terms of sustainability, according to a number of studies [5]. These studies also urge public institutions to mix economic, environmental, and social factors in their procurement activities. In order to influence the market and non-market operations and achieve environmental sustainability in the economy, the notion of sustainable procurement has thus been utilised frequently in literature. Specifically, "Sustainable procurement means making sure that the products and services an organization buys achieve value for money and generate benefits not only for the organization, but also for the environment, society and the economy. Sustainable procurement entails both Green Public Procurement (GPP) and socially responsible public procurement (SRPP)" [6] is how sustainable procurement is defined. Government purchases of sustainable products and services would have a greater impact on the economy and environment. Studies, however, show that public sector organizations do not always use sustainable procurement practices [7].

Due to rising government spending, sustainable public procurement is a crucial component of sustainable development. By bringing businesses and policymakers together, sustainable procurement aims to advance sustainable development. The majority of emerging nations, including China, do not have the necessary infrastructure to support the sustainability of the public sector.

We chose China as the study's target economy for a variety of reasons. China serves as a representative example of an expanding nation that is very vulnerable to the negative effects of climate change and has made little effort to combat those effects. According to [8], China was among the top ten nations that were negatively impacted by climate change over the last twenty years (1997 to 2016). According to [9], China's per capita climate change impact is extremely significant compared to the country's relatively small contribution to global GHG emissions. China's government formed its environmental policy in 1978 with the primary goal of protecting the environment and biodiversity to encourage sustainable development practices and to reduce emission levels in the nation. As a result, supporting sustainable development and halting climate change are now China's top priorities. One of the crucial policy tools that can assist governments in achieving sustainable development and protecting the environment is sustainable public procurement (SPP). However, there is no proof that China has chosen such a course of action. There are a number of factors that prevent China from implementing sustainable procurement. The existing work in this field has mostly overlooked developing nations in favour of concerns affecting industrialised economies [10]. This study closes the knowledge gap by looking into the challenges that poor nations encounter while implementing sustainable procurement.

To evaluate the elements that hinder the adoption of sustainable procurement, we used a representative sample of public institutions in China. According to the literature, public sector universities that use sustainable procurement encounter a wide range of issues. Because government-approved procurement standards determine the type of service delivery in the public sector, universities must navigate a complex set of legal requirements. In addition to providing services and consuming public goods, public sector colleges have a unique type of expertise in education. Numerous studies, such as [11–13], have explored environmental problems that colleges may encounter. These concerns span a range of topics, such as product recycling, pollution, climate change, resource depletion, ethical sourcing, and challenges relating to the atmosphere. Because universities have such a large impact on how future generations will approach these issues, policies that are implemented within the context of universities help promote sustainable development [14–16]. Many institutions are now serious about the issue of energy use and greenhouse gases, and they have included sustainability courses in their curricula [17]. Universities spend a significant portion of their budget on purchasing products and services, in the same way as other public sector organizations. They may significantly impose sustainable products and services if they consider environmental factors when making purchasing selections. [18] A key barrier to sustainable procurement has been identified as being a lack of trained staff, a lack of senior management commitment, the participation of bureaucracy and economic actors, and a lack of a culture that supports the environment. Furthermore, [19] found that there is little academic literature available for practitioners to use in order to implement sustainable procurement. Therefore, the main goal of this study is to investigate the inter-relationships between the causes and factors that prevent the adoption of sustainable procurement in China's public sector universities (PSUs).

In contrast to earlier studies, this one adds to our knowledge in a variety of ways. As far as we are aware, this is the first investigation of the factors that influence sustainable purchasing at Chinese public sector universities (PSUs). This study grabs stakeholders' attention and adds to the scant amount of literature on sustainability in developing nations. A plan for sustainable procurement in China is also being developed as a result of this study in order to address long-term sustainable development. We have separated the components into sections for internal (inside the organization) and external (outside the organization) elements to help improve understanding.

The essay is structured as follows for the remaining portions. The literature review is covered in Section 2, the technique is covered in Section 3, the modelling results and analysis are shown in Section 4, the conclusion is revealed in Section 5, and the study recommendations are covered in Section 6.

2. Literature Review

In order to achieve the Sustainable Development Goals (SDGs) as outlined by [11,20–22], numerous governments, private organizations, and international organizations (such as the UNDP, European Commission, USAID, etc.) have taken the initiative to include environmental and social considerations in their procurement criteria. Public procurement, as stated by [23], has aided in forming various sustainability decisions, such as supplier decisions, and climatic and environmental legislation. Furthermore, according to [24], green procurement has become a new cutting edge globally. Sustainable development places the most emphasis on environmental procurement factors, such as resource consumption, recyclable materials, and pollution-free operations [11,25,26].

Universities must include their academics, staff, and students in interdisciplinary projects at all societal levels in order to lead the way in sustainable procurement [27]. This study [27] researched the major impediments to institutionalising sustainable development and offered suggestions for how to get rid of them. These obstacles are determined by the needs of each university and the demand for leaders who will actively support the initiatives in order to win permission for them. By looking for keywords suggesting the incorporation of sustainable aims in the universities' visions and missions, some authors, such as [28], investigated the level of dedication in the institutions adopting sustainable development. The findings showed that although many colleges publicly display goals and ideals connected to sustainability, their devotion is not reflected in their vision. For the execution of sustainable public procurement, it is necessary to overcome this discrepancy between university goals and activities.

2.1. Internal Factors

According to the study [12], the main obstacle to the implementation of sustainable public procurement is the general public's lack of knowledge regarding the true environmental impact of products. The drafting of tender documents and purchasing are challenging for purchase officials due to a lack of information. Other obstacles to the adoption of sustainable public procurement include the lack of a defined definition and evaluation criteria for green procurement. For instance, several authors [29,30] believed that knowledge was the foundation for creating sustainable public procurement norms; [29] went on to say that because senior management does not always know the costs and advantages of sustainable public procurement, they do not view it as a valid or necessary endeavour.

Employees often consider extra rewards for extra effort since they believe buying green items requires more work and time than regular procurement. Employees develop a certain behaviour toward sustainable public procurement based on incentives and anticipated rewards. According to the research [31], the adoption of sustainable public procurement is directly and strongly impacted by the green buying behaviour of procurers. In order to utilise all of the potentials of their workforce and implement sustainable public procurement successfully, businesses must foster favourable procurer behaviour.

Another obstacle to the implementation of sustainable public procurement is a lack of professional workers. According to certain studies [32,33], environmental training is a crucial component of sustainable procurement. For effective implementation, companies must grasp the notion of sustainable public procurement and its related government norms and regulations. Organizations should thus create these tools so that they may engage in sustainable procurement. Research detailed in [18] examined Brazilian universities to determine how environmental training affected sustainable procurement. It recommended that the first step in implementing sustainable public procurement should be environmental training.

The fact that many procurement officers in China are unaware of the characteristics and effects of sustainable procurement is also true. They are not well-informed about the types of green products that are readily available on the market or how sustainable procurement can be implemented. Therefore, in China's public sector, having qualified workers, pro-sustainable procurement behaviour, and regular training sessions are crucial.

Funds are distributed according to regular market prices in the public sector, but green products are more expensive. For instance, it is commonly accepted that ecologically friendly or green production methods are more expensive than others [33]. As a result, management sticks to the budget it has set and does not practise sustainable procurement. A budget is also needed for procurement officials' specialised training courses. Another guiding principle for firms is the cost of implementing sustainable procurement.

Budgetary assistance and financial incentives are crucial for sustainable procurement in the public sector, according to [34,35], who maintained that budgetary restrictions cause excessive procurement costs. According to the study [33], a significant barrier to the adoption of sustainable procurement is the cost of green products, which are generally more expensive than conventional products. Organizations perceive the cost of green products as an additional strain on their budgets [11]. Sustainable costs may be high during the early phases of manufacturing, but once economies of scale are reached, these higher costs are balanced out by long-term advantages.

Implementation of green public procurement may be sped up or slowed down depending on top management commitment and organizational process and structure design [29,32,36]. The private sector places a higher value on procurement than does the public sector, as evidenced by its organizational structures and cultures [37,38]. According to studies, a significant barrier to the adoption of sustainable procurement in the public sector is a lack of managerial commitment [29,32,39–42].

If the firms have implemented other environmentally friendly creative practices such as green technology, sustainable waste management systems, a green campus, SMART construction, and energy efficiency, etc., implementing sustainable procurement will be simple. According to [43], company culture, motivation, and knowledgeable employees all play a role in encouraging innovation in green practices. Research in [44] further asserted that the adoption of numerous additional green practices in a company is a direct result of the adoption of one green practice.

When top management or purchasing agents believe sustainable procurement to be unsuccessful, it is also not practised. It occurs when green items are hard to find and searching for them costs money and takes a lot of time [45]. For instance, it is challenging to rely on green products in the health sector, where highly specialised goods are needed [11].

2.2. External Factors

Government regulation is reportedly the key enabler of sustainable public procurement in public sector companies, according to studies [12,46]. Organizations are mostly driven to engage in sustainable procurement by government-backed, clear regulations [23,47]. Furthermore, [48] advocated for governments to mandate some green practices across all industries to promote a sustainable environment. Through incentives, businesses must be pushed to purchase eco-friendly products [49]. Those who implement sustainable procurement principles may be rewarded with tax breaks or price concessions [35].

Since the general public is the actual end user of public procurement, numerous studies have discovered that public pressure is a major component in the implementation of sustainable public procurement [12,47,50–52]. Procurement agencies will be required to use sustainable procurement methods if the general public is aware of the items and their effects on the environment [35]. Stakeholder pressure on procurement agencies causes them to exert pressure on suppliers to provide green products [53].

In the public sector, procurement knowledge is equally crucial. Recognizing suppliers' acceptance or opposition is crucial for their compliance with sustainable public procurement. Suppliers must be compelled to provide documentation demonstrating their

dedication to environmental conservation. For instance, as [54] explained, suppliers may be asked to provide paperwork outlining the efforts they are making to preserve the environment and how they comply with all applicable legal obligations. Additionally, suppliers are required to protect the environment throughout the whole product lifecycle, from the point of purchase through the point of sale. Research in [12] identified that the difficulty of involving suppliers is a major barrier limiting the adoption of sustainable procurement, while [25] found that the primary reasons suppliers are unwilling to participate include poor supplier practices, a lack of resources, and the sensitive nature of their information.

It can be difficult to find sustainable products and services in developing nations, especially when specialised public goods are needed [25]. They added that the lack of green product availability causes many sustainable public procurement programs to fail.

In industrialised and developing nations, numerous approaches to addressing the factors influencing sustainable public procurement have been taken. The existing literature discusses the factors that contribute to developed economies, and it mostly comes from developed countries. As developing nations' economic systems are similar, the findings of this study can be applied to all of them. The ranking of the determinants according to their relative relevance is revealed in the next section using a methodical approach.

3. Materials and Methods

Based on earlier research [55–58], our study uses content analysis and survey methods to determine the state of sustainable procurement in China's public institutions (see Figure 1). To determine how much sustainability is taken into account when PSUs make purchases, we began our data gathering procurement by scanning the websites of all public sector universities in China. The information that colleges post on their websites and in public bids can be used to evaluate their commitment. We looked at the most recent 100 tenders from all public sector colleges, but the documentation for those tenders did not mention sustainable procurement. None of the universities incorporated sustainability in their bid evaluation criteria, and all procurement tenders were traditional. This exercise proved that impediments must be addressed and quantified in order for appropriate policy suggestions and development to be made [59–62].

The second step was a thorough assessment of the literature, during which we identified 17 significant obstacles that could affect sustainable procurement. To examine the chosen hurdles, we chose five experts with 10 or more years of public procurement expertise from five different public sector universities. To understand the significance of each element and how it related to others, their input was necessary. The top 12 impediments for Chinese public universities, according to experts, are listed as follows. We created a survey that was distributed to 75 officers in senior positions with more than three years of experience in public procurement at the university level in order to further investigate the relationships among the 12 barriers [63–65].

The post-positivist paradigm, which aids in quantitatively defining reality and also provides the crucial traits of a chosen sample, was adhered to in the writing of the study. Our study, which is based on earlier research [11,14–16,66], uses content analysis and survey methods to determine the state of sustainable procurement at China's public sector universities. Respondents for this study were senior Chinese university-level procurement officials with more than three years of experience in public procurement. Because a random sample technique was used in this study, each responder had an equal chance of being chosen. From this demographic (see Table 1), a representative sample of 287 (See Table 1) procurement officials' responses was selected, with 11 responses being disregarded. Items from previously published studies by Carter and Jennings [40] and Walker and Brammer [24] were used to create a questionnaire. On a Likert scale with five possible outcomes, from 1 (strongly disagree) to 5 (strongly agree), all constructs were evaluated. The CFA tool was employed in this work to evaluate the instrument's reliability, and the SEM tool was used to analyse the measurement model's reliability, rationality, convergent validity, and discriminant validity. Additionally, by using CFA, the frame model's compati-

bility with the data acquired was evaluated [67]. Whereas convergent validity was used to assess factor loading value, discriminant validity was used to measure composite reliability along with the Fornell–Larcker test [68].

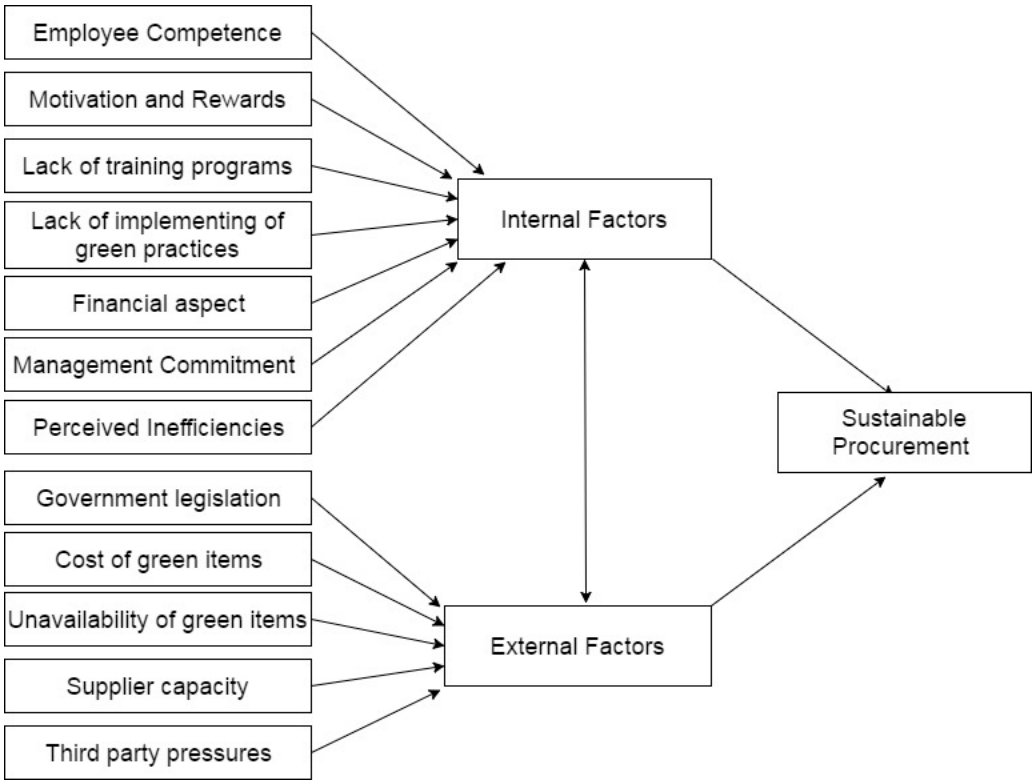

Figure 1. Conceptual framework of internal and external barriers to GPP implementation.

Table 1. Demographic information.

Demographics Information	Frequency	Percentage
Gender		
Male	247	80.5
Female	60	19.5
Marital Status		
Single	188	61.2
Married	119	38.8
Age		
20–25	23	7.5
26–30	69	22.5
31–35	58	18.9
36–40	112	36.5
Over 40	45	14.7
Qualification		
High School	17	5.5
Higher secondary school	42	13.7
Bachelor's degree	89	29.0
Master's degree	148	48.2
Doctorate	11	3.6
Experience		
3–5 Years	187	60.91
6–9 Years	93	30.29
Over 9 years	27	8.79

4. Result and Discussion

4.1. Measurement Model

The two-step approach identified by Anderson and Gerbing [69] was applied and tested in SEM. Regarding the first step, for evaluation of relationships among the variables and latent constructs, CFA was tested. Findings after applying CFA show that all values and ranges were acceptable in the whole scenario, which further reflects the goodness of the model (χ^2 (1144.453) = 94, χ^2/df = 1.834, SRMR = 0.042, GFI = 0.941, AGFI = 0.901, NFI = 0.913, RFI = 0.969, CFI = 0.946; TLI = 0.936; RMSEA = 0.052). While in the second strand, for confirming measurement model CR (composite reliability), convergent and discriminant validity [70] tests were applied for further proceedings. All CR scores, shown in Table 2, were between 0.87 (0.70) and 0.88, and above the cut-off value of 0.70.

Table 2. Confirmatory factor analysis.

Constructs	Statements	SFL
Sustainable public procurement CR = 0.883, AVE = 0.715, $\sqrt{}$AVE = 0.846	To what extent sustainable procurement is implemented in your organization?	0.842
	To what extent environmental criteria are included in the tender documents?	0.869
	To what extent your organization asks the suppliers to commit to waste reduction goals?	0.825
Government Rules and Regulations CR = 0.885, AVE = 0.719, $\sqrt{}$AVE = 0.848	There is lack of mandatory Sustainable Public Procurement (SPP) rules/legislation	0.850
	There is a lack of relevant SPP manual (SPP criteria and specifications)	0.849
	There is Insufficient monitoring, evaluation and/or enforcement of Procurement policies	0.845
Management Commitment CR = 0.867, AVE = 0.686, $\sqrt{}$AVE = 0.828	Top(senior) management is not committed to implement SPP	0.814
	A procurement strategy is not well planned at top level	0.836
	Decentralization (authority to purchase locally) can bring sustainability in the public sector	0.834
Financial Aspect CR = 0.889, AVE = 0.728, $\sqrt{}$AVE = 0.853	Cost of green products is higher than the normal (non-green products)	0.853
	Our organization does not have sufficient funds to procure green products	0.833
	There is no financial benefit if sustainable public procurement is applied	0.874
Supplier Capacity CR = 0.896, AVE = 0.741, $\sqrt{}$AVE = 0.861	The suppliers do not have appropriate knowledge of green items	0.878
	There is a lack of information on the sustainability practices and operations of suppliers	0.855
	The suppliers cannot provide you sustainable products/services if you demand	0.849
Employee motivation and rewards CR = 0.862, AVE = 0.675, $\sqrt{}$AVE = 0.822	There is lack of personal commitment to SPP by staff	0.836
	Employees are not encouraged to take initiatives in our organization	0.833
	SPP is an extra burden on procurement staff because there is no reward	0.795
Employee competence CR = 0.888, AVE = 0.725 $\sqrt{}$AVE = 0.851	There is lack of expertise of procurement staff in SPP implementation	0.851
	There is a lack of a clear definition of sustainable products, services and/or supplier operations	0.851
	Our organization does not have the capacity for SSP implementation	0.852
Training programs CR = 0.884, AVE = 0.720, $\sqrt{}$AVE = 0.848	There is a lack of training of procurement staff for SPP	0.701
	Training programs will enable the procurement staff to implement SPP	0.899
	Employee training is the top-ranked barrier to SPP implementation	0.927
Perceived ineffectiveness CR = 0.795, AVE = 0.565, $\sqrt{}$AVE = 0.752	Sustainable products and/or services are of lesser quality	0.767
	There is a lack of external recognition for SPP implementation	0.779
	Procurement is administrative, not policy-driven	0.707
Prices of Green items CR = 0.701, AVE = 0.502, $\sqrt{}$AVE = 0.701	The prices of sustainable goods are higher than the conventional ones	0.216
	The price is more important than long term sustainability	0.716
	Pricing is the top-ranked barrier to SPP implementation	0.957

Table 2. *Cont.*

Constructs	Statements	SFL
Lack of green initiatives CR = 0.875, AVE = 0.701, $\sqrt{}$AVE = 0.837	There is a lack of sustainable practices in your organization	0.783
	Organization culture is weak in taking sustainable initiatives	0.797
	The organization does not stress on corporate citizenship behaviour	0.924
Unavailability of Green Products CR = 0.826, AVE = 0.613, $\sqrt{}$AVE = 0.783	There are lack of sustainable products and/or services to procure	0.768
	You will always prefer sustainable goods over conventional, if available	0.764
	There is no role of organizations in creating demand for sustainable products	0.815
Lack of Third Party Pressure CR = 0.804, AVE = 0.577, $\sqrt{}$AVE = 0.760	There is a lack of external pressure from stakeholders / no activist campaigns	0.731
	Customers can influence the procurement policies of your organization	0.759
	International organizations (e.g., USAID, UNDP, World Bank, etc) can influence the procurement procedure of your organization	0.788

SFL = Standardized factor loading.

As recommended by Fornell & Larcker [68], we applied both types of convergent as well as discriminant validity techniques in this study. The results which are depicted in Table 2 indicate that all factor loadings were in the range of 0.719 to 0.871, which matches with the criteria defined by Hair et al., [71] and further, the AVE values which are mentioned in Tables 2 and 3 are between (0.50 and 0.74) 0.53 and 0.69, which further satisfy all the cut-off values, which are 0.50 in reality. Furthermore, regarding the discriminant validity, the values for all constructs and their correlation should be less than the threshold score value, which is 0.85 [72].

Table 3. Descriptive statistics and evidence of discriminant validity.

Construct	CR	AVE	1	2	3	4	5	6	7	8	9	10	11	12	13
Supplier_	0.896	0.741	0.861												
Compet_	0.888	0.725	0.980	0.851											
Motivaton_	0.862	0.675	0.237	0.296	0.822										
Training_	0.884	0.720	0.086	0.122	0.082	0.848									
Practices_	0.875	0.701	−0.040	−0.038	−0.055	0.212	0.837								
Finance_	0.889	0.728	0.183	0.481	0.193	0.053	−0.028	0.853							
Managt_	0.867	0.686	0.001	0.384	0.101	0.073	−0.080	0.281	0.828						
Ineffe_	0.795	0.565	−0.024	−0.058	−0.029	0.093	0.091	0.003	−0.005	0.752					
Govt_	0.885	0.719	0.297	0.191	0.299	0.051	−0.015	0.184	0.008	−0.006	0.848				
Prices_	0.701	0.502	0.030	0.035	0.032	0.191	0.142	−0.004	−0.006	0.163	0.008	0.701			
Unavailaity_	0.826	0.613	−0.047	−0.026	−0.061	0.308	0.186	−0.035	−0.081	0.120	0.001	0.138	0.783		
Third_	0.804	0.577	−0.048	−0.027	−0.021	0.397	0.516	−0.058	−0.044	0.287	0.008	0.449	0.593	0.760	
Sustain_	0.883	0.715	0.980	0.011	0.199	0.057	−0.060	0.395	0.199	−0.005	0.007	−0.012	−0.048	−0.054	0.846

In the diagonal row, the bold numbers denote square roots of AVE. Note: 1 = Supplier, 2 = Employee Competency, 3 = Employee Motivation, 4 = Training programs, 5 = Green practices, 6 = Financial aspect, 7 = Management commitment, 8 = Perceived ineffectiveness, 9 = Government Rules and regulations, 10 = Prices of green products, 11 = Unavailability of green items, 12 = Third party pressures, 13 = Sustainable public procurement.

4.2. Structural Model

The measurement model demonstrates reasonable and acceptable goodness-of-fit. We also tested the structural model using SPSS Amos Graphics version 18.0. The results are as follows: (χ^2 (1234.428)) = 713, χ^2/df = 1.731, SRMR = 0.032, GFI = 0.922, AGFI = 0.906, NFI = 0.913, RFI = 0.910, CFI = 0.961; TLI = 0.960; and RMSEA = 0.048. These results demonstrate that the structural model fits the data well and identifies the efficiency of the structural relationships between variables [69].

The results of the hypothesis tests, as shown in Table 4, reveal that hypothesis # 4, 7, and 9 are rejected. The results support the hypothesis that green practices do not impact SPP implementation significantly. Similarly, the ineffectiveness of green products and the prices of green items also do not impact SPP implementation significantly. The remainder of identified independent variables possess a positive effect on sustainable public procurement as the *t*-values are greater than 1.92 at 1% or 5% significance levels.

For example, we accept H1, which states that employee competency positively contributes to sustainable procurement implementation. Our decision is based on values such that ($\beta = 0.227$, $t = 2.780$, $p < 0.05$).

Table 4. Hypothesis test results.

		Challenges	Estimate	C.R (*t* Value)	Significance Level	Decision
Sustain_	<—	Employee Competency	0.227	2.780	0.05	Accepted
Sustain_	<—	Employee Motivation	0.139	2.933	0.05	Accepted
Sustain_	<—	Training programs	0.112	3.148	0.005	Accepted
Sustain_	<—	Green Practices	0.013	1.267	0.100	Not Accepted
Sustain_	<—	Financial aspect	0.202	3.867	0.001	Accepted
Sustain_	<—	Management commitment	0.245	2.978	0.05	Accepted
Sustain_	<—	Ineffectiveness of green products	0.026	1.1301	0.100	Not Accepted
Sustain_	<—	Govt. rules and regulations	0.266	3.018	0.001	Accepted
Sustain_	<—	Prices of green items	0.020	1.480	0.100	Not Accepted
Sustain_	<—	Unavailability of Green Products	0.286	2.529	0.05	Accepted
Sustain_	<—	Supplier Capacity	0.467	5.193	0.001	Accepted
Sustain_	<—	Third Party pressure	0.478	5.636	0.001	Accepted

Sustain_depicts sustainable public procurement (Dependent variable).

By using the SPSS-AMOS 25, we designed Figure 2 to reflect the interconnections between sustainable public procurement and all the independent variables of the study. The results confirmed that all the identified independent variables significantly affect the sustainable public procurement implementation in public sector universities in China.

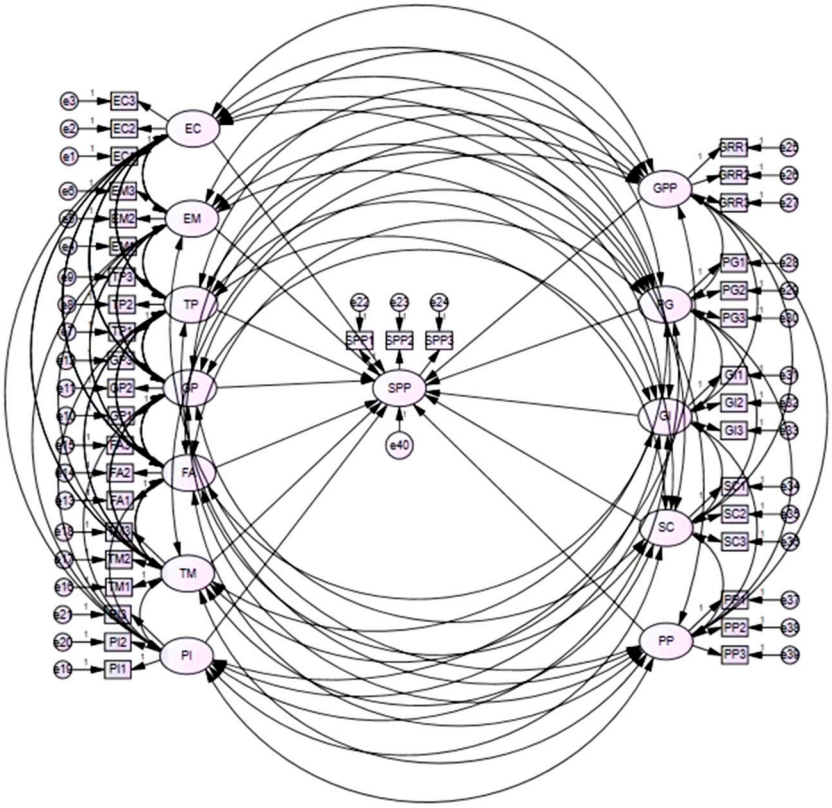

Figure 2. Path Coefficients of SEM.

5. Discussion

Researchers can fill in the gaps and better comprehend the motivations behind the study's ideas by comparing and contrasting them with the literature [40,44,53,62] thanks to the discussion of research findings, which enables them to look at the study's issues and

concerns from a variety of angles. Employee competency, employee motivation, training programs, financial aspect, management commitment, government rules and regulations, unavailability of green products, supplier capacity, and third party pressure all have a positive and significant relationship with public procurement sustainability [73–78]. On the other hand, green practices, ineffectiveness of green products, and prices of green items have an insignificant relationship with sustainability public procurement [79,80].

By implementing green policies, public universities should take the lead in promoting sustainable development [73]. The curriculum for a course should contain a sustainable procurement module. Students should receive sustainability education as well because they will be the future leaders and key participants in the circular economy. All such policies that contribute to sustainability should be followed by management [76,77]. The top management should be seriously committed to sustainability and should support the pursuit of sustainable goals by the mid-level management. The budgets of public institutions should be increased by the government while keeping in mind the cost of environmentally friendly products. Universities must invest in employee training, particularly for sustainability. If more businesses purchase environmentally friendly products, there will be more providers on the market, which will lead to reduced prices. The management may invite the suppliers to contribute when arranging the procurement. The management should give the procurement team financial and performance incentives to boost motivation. To improve their competencies, they can be dispatched to distant locations for training and capacity-building seminars. To keep mid-level management aligned with sustainable procurement, management should occasionally apply pressure. In order for green products' pricing to be competitive with those of conventional goods, the government should provide subsidies to the companies that produce them.

6. Conclusions

In China, sustainable procurement is a relatively new idea. Growing environmental problems necessitate immediate focus on sustainable practices. Through sustainable procurement, such procedures can assist achieve sustainable development and manage environmental problems. This study's main goal is to pinpoint the factors preventing China's public universities from implementing sustainable procurement. We primarily use ISM to pinpoint the critical factors that influence sustainable procurement in the public sector. The approach was created after agreement between specialists in public sector procurement. The outcomes are rather general, and similar ones are anticipated in other developing nations as well. As a result, other developing nations can likewise implement the study's recommendations.

Employee competency, employee motivation, training programs, financial aspects, management commitment, government rules and regulations, unavailability of green products, supplier capacity, and third party pressure are all found to have a direct relationship with the sustainability of public procurement in this study. While on the other hand, insignificant direct relationships are found in green practices, ineffectiveness of green products, and prices of green items with sustainability in public procurement. This report examines the internal and external difficulties facing China's public HEI industry. Through sustainable procurement, these procedures can aid in achieving sustainable development and lowering environmental problems. These studies offer detailed suggestions for accomplishing sustainable development objectives to future researchers and policymakers, notably in China's public sector university sector. This study contributes to the existing limited literature available on sustainability in developing countries and attracts the attention of stakeholders. Moreover, this study is very important in designing a roadmap for sustainable procurement in China to address its long-term sustainable development. This study used data from public sector universities; therefore, its application is limited to some of the public sectors but not the whole country. Future studies can cover some more public sectors to examine the implementation status of sustainable public procurement and the key challenges being faced by such sectors.

Furthermore, an organization's culture is important. Sustainable procurement is simple to implement if there are established management practices that support sustainability; otherwise, the opposite is true. However, once a strong organizational culture is developed by management, this culture is influenced by the government as well. In order to achieve the Sustainable Development Goals (SDGs), China has to take the initiatives to include environmental and social considerations in their procurement criteria.

This research study has a limitation in that its results are not generalizable for other developing countries because it covers only data from China. Data were collected from procurement officials at higher education institutions that are part of the public sector in China, therefore for future research, we recommended including more private and public sector universities from developing and developed countries to make a comparison on a large scale about sustainable procurement.

7. Recommendations

We urgently urge the government to establish a green public procurement strategy because adoption and development will take a significant amount of time. The best green procurement methods used by industrialised nations should be adopted by developing nations. As an illustration, the European Commission has published a guide for appropriate procurement practices that late arrivals might use [73,81]. Pressure can be applied to public sector universities to embrace sustainable public procurement with the aid of explicit regulations. Government should start a green procurement plan first, then take the lead so that other sectors will follow. Similar to what the study of [82] showed, governments must demonstrate a larger commitment to the SP, provide a public access database containing these items, and demonstrate widespread distribution of the initiatives/products of businesses committed to sustainable procurement. PPRA must first take the initiative by adopting a green procurement strategy for public sector organizations. It should offer thorough training to all involved suppliers and members of the purchasing department. Management should adhere to all such regulations that promote sustainability. Government spending should be increased while taking into account the cost of green products. Organizations must invest in staff training, particularly for sustainability. There will be more vendors on the market and subsequently reduced prices if more businesses desire green products. The management may invite the suppliers to contribute when preparing the purchase [73,81].

The government ought to offer certain incentives to green vendors. Top management should encourage its staff to adhere to the sustainable procurement policy and should discipline them if this does not happen. This will demonstrate their commitment to the SSP. We suggest creating a procurement forum, where public sector procurement officers can discuss their sustainability-related procurement concerns and share their best practices, models, and templates. The government must take part in organizing such a meeting to support SSP activities. On such a platform, international best practices might be accessible. While ranking the Chinese colleges, universities ought to give points for sustainable procurement. It should also introduce the Green University Initiative to the nation. The price of green products must be taken into account while distributing the funding for the institutions. It should invest more resources in enhancing the capacity of university administrators who work with procurement.

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