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Strategic Visionary Leadership and Sustainable Governance: Navigating Higher Education Reforms for Optimal Performance in the Age of Disruptive Technologies

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This study examines the influence of disruptive technologies on higher education institutions (HEIs) in Pakistan, with a particular emphasis on the importance of visionary leadership and sustainable governance in driving educational transformations and enhancing performance. This study employs a quantitative methodology by conducting surveys among academics and researchers from various universities to gather data on pertinent parameters. The questionnaires employ a five-point Likert scale. This study employed Structural Equation Modeling (SEM) to assess the impact of leadership, technology, and governance on student accomplishment. The results indicate that institutions derive significant advantages from visionary leadership since it strongly promotes innovation in higher education. These advancements are driven by sustainable governance to ensure adaptability and strategic alignment with global educational standards. Educational reforms facilitate the connection between enhanced institutional performance and the integration of disruptive technologies like AI and robotics, underscoring the necessity for Higher Education Institutions (HEIs) to adapt to technological advancements. The study reveals that in order to thrive in the current technologically-driven educational landscape, higher education institutions (HEIs) need to adopt innovative and forward-thinking approaches to governance, considering the intricate relationship between leadership, governance, and technology in educational settings.

Keywords: disruptive technologies, Higher Education performance, visionary leadership, sustainable Governance, educational reforms, Structural equation modeling.

The billionaire person and entrepreneur of the century Bill Gates says I believe in innovations and that the way you get innovation is you fund research and you learn the basic facts (Carleton & Cockayne, 2023). No doubt the research generates facts and knowledge, and with the combination of logical reasoning, it is regarded as the most successful approach to the discovery of truth. The world is now on the threshold of research, innovation and discoveries, and this is a knowledge revolution driven by the knowledge (Chaithanapat et al., 2022). The knowledge revolution has drastically emerged and gone beyond the transformation of societies and aspects of life. For the knowledge-driven economy, knowledge is distinguished as a very powerful factor for economic growth. Simultaneously, other global forces in the shape of disruptive technologies have entered into our society, life and business. The disruption is a very intensified and powerful and changing world beyond expectation. Currently, skills and competency are required to closely work with evolving machines, artificial intelligence, robotics and expert systems. Disrupting technologies aregripping all countries, sectors, businesses, and increasingly, workers and the environment are beyond our expectations (Woetzel, 2019). As per the Mckinsey report, the twelve (12) disruptive technologies will bring a significant impact on the global economy by 2025, transforming life and business (Tarr, 2021). Developed countries are already working with these disruptive technologies, and convincing efforts and proper strategies are required to deal with these forces in higher education in Pakistan.

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Now, the economic center of any country is dependent on the educational system and the factors influencing it (Mirazchiyski et al., 2024). In such a scenario, higher education is also challenged by the disruptive forces that demand skilled graduates, high-value research and innovations, modern pedagogies methods and improved governance of universities (Sharma & Sharma, 2021). Disruptive technologies like advanced robotics, next-generation genomics, and energy-storage devices have the potential to drive massive economic transformations. HEIs can support the adoption and development of these technologies, ensuring they contribute positively to the economy. In this way, as a reaction to the difficulties of supportability. Advanced education Foundations (HEIs) have taken a few drives to address the difficulties and looking for arrangements, HEIs all through the world arranged and began a few endeavors to change and reengineer their exercises (for example scholastic, research, regulatory and monetary). HEIs are often at the forefront of research in new technologies, contributing to innovation and the development of new applications that can drive economic growth (Jayabalan et al., 2021). HEIs can also contribute to policy discussions on how to integrate new technologies into society in a way that maximizes benefits and minimizes disruptions(Siddhpura et al., 2020). HEIs often support entrepreneurship through incubators and accelerators, helping to transform innovative ideas into economic opportunities (Tierney & Lanford, 2016). Additionally, HEIs provide the necessary training and education to prepare students for the evolving job market, ensuring that there is a pool of qualified individuals who can work with and advance these technologies.

In the global competitive battle of the knowledge-based economy, the countries rapidly bringing reforms in the structure and policies for betterment of higher education. However, the powerful forces of disruptive technologies, the system of higher education is experiencing a series of contextual changes and to see disruption as a source of innovation, intellectual mindset, visionary leadership, and continuous development of faculty is required (Rehman et al., 2024)). Due to rapid expansion, the sector needs more resources like skilled faculty, infrastructure and finances. Furthermore, universities are facing serious challenges and issues like good governance, scarcity of funds, modern infrastructure, quality of research. Within universities in Pakistan, also some governance issues lead to poor institutional reforms and academic excellence. Murtaza and Hui (2021) stated that, the apex body of the majority of universities lacks autonomy and is put under the external and internal influence which making policy decisions., knowledge transfer, commercialization and academic excellence. At the one side the higher education sector in Pakistan facing serious challenges, on the other side the intensified powerful forces of disruptive technologies have created more gaps in academia (Inayat, 2022). current study aims to identify the deficits contribution to building a knowledge-based society and, the universities in Pakistan can surely find a new means of adding high value to society and the economy to deal with disruptive technology. Following are the research question of the study:

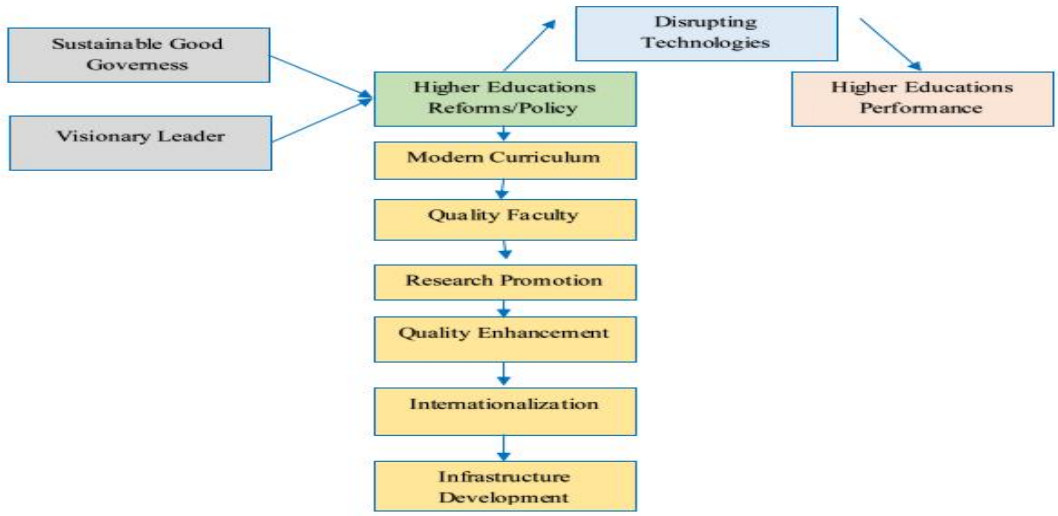
RQ_1: What is the critical role of visionary leaders to develop and implement HEIs policy?
RQ_2: Does sustainable good governance stimulus HEIs policy?

RQ_3: How universities in Pakistan can contribute to society and the economy by addressing the challenges of disruptive technology.

This study contributes in several ways. First, it highlights the necessity for innovation and visionary leadership within higher education to navigate the challenges posed by disruptive technologies. Second, it discusses the governance issues within Pakistani universities that hinder institutional reforms and academic excellence. Third, the text emphasizes the growing need for resources such as skilled faculty, infrastructure, and finances due to the rapid expansion of the higher education sector. Fourth, it acknowledges the widening gaps in academia due to the powerful forces of disruptive technologies. Finally, it serves as a reflection on the current state and future directions for educational institutions in a rapidly changing technological landscape.

The paper is organized as follows: Section 2 summarizes the body of research, and Section 3 presents a thorough examination of the study's data and methodology. Section 4 discusses the research results, and Section 5 includes the study's discussion and conclusion.

Study Framework



Literature Review

Higher Education Performance

In every facet of human existence, education has played an essential and far-reaching role. When it comes to intellectual capital, business acumen, and societal problem-solving, HEIs and universities play a special and crucial role (Raza et al., 2023). They collaborate in several aspects of life, particularly in the field of education, which is advantageous for enhancing future educational exchanges between nations. Hinduja et al. (2023) find out It has been determined that sustainability is a worldwide issue that prompts academics and educators to include sustainability considerations into educational curriculum. The rapid growth of private higher education institutions in Pakistan, while enhancing access, has raised concerns about quality, mirroring trends in other developing countries. Poor quality and lack of government oversight are highlighted, suggesting a need for stronger regulatory mechanisms to ensure educational standards (Zheng et al., 2024). higher education in Pakistan is at a crossroads with numerous challenges, but also with multiple opportunities for reform and improvement to meet the demands of a growing knowledge economy. Addressing these issues is essential for enhancing educational outcomes and economic development in the country.

Hypothesis Development

Sustainable Good Governess and Higher Education Reforms

Education is a fundamental need and imperative for every human. Higher education has a pivotal role in fostering the growth of students and learners by enhancing their competencies and capabilities. An administration of higher education is essential and indispensable for the implementation of management strategies and the development of learning prospects. Various civilizations exhibit distinct educational paradigms that need the implementation of laws and regulations tailored to their unique social dynamics (Al-Kubaisi et al., 2023). The Higher Education Commission of Pakistan operates under the guidance of the Ministry of Education and maintains both worldwide and national partnerships with esteemed organizations and institutions to foster educational advancement. Khan et al. (2019) identify Examine the broader historical framework and cultural aspects of Pakistan's public sector, with a specific focus on higher education. These viewpoints have a significant impact on both the functioning of the government and the formulation of policies and development efforts. The comprehension of context plays a crucial role in elucidating the complexities and obstacles linked to the formulation and execution of policies. Higher education is a crucial component of the government and has a significant impact on the attainment of national objectives in the era of knowledge-based economic growth. Consequently, it is imperative to formulate and execute well-designed policies that consider both international standards and domestic requirements and resources. As Andrews (2008) He highlights that policies and plans may not accurately reproduce in other settings due to the varying environmental and cultural constraints. Attempting to mimic them may result in changes that are incongruous and contradictory, similar proverbs that are not suitable for the incorrect context. In the preceding conversation, we put out the following hypothesis:

H_1: Sustainable Good Governess has a positive impact on Higher Education Reforms.

Visionary Leadership and Higher Education Reforms

The relationship between visionary leadership and higher education reforms is a significant topic of discussion in the field of educational administration and policy development. Visionary leadership is often seen as a crucial driver of higher education reforms (Candrasari et al., 2023). Leaders with a clear vision can foresee future challenges and opportunities in the education sector, enabling them to pioneer reforms that are timely and relevant. They possess the ability to guide organizations through periods of change that align with the changing demands of society, improvements in technology, and worldwide patterns. Forward-thinking executives have a crucial impact on the development and execution of strategic plans and changes. They possess expertise in establishing objectives for the future, determining the necessary actions to accomplish these objectives, and efficiently coordinating resources. The individual's capacity for strategic thinking contributes to the seamless execution of reforms, guaranteeing that modifications are not only conceptual but are efficiently incorporated into the institutional structure. Higher education modifications often want inventive methodologies and imaginative resolutions to intricate issues. Visionary leaders are characterized by their forward-thinking mindset and willingness to embrace novel concepts, fostering a culture of innovation inside organizations. This setting promotes scholarly and investigative superiority, resulting in more influential educational changes. The successful implementation of changes in higher education requires the active support and commitment of diverse stakeholders, including academic members, students, administrative personnel, and external collaborators. Visionary leaders has the skill to establish agreement and promote cooperation, guaranteeing that innovations are endorsed and accepted by the broader academic community (Sarnkhaowkhom & Suwathanpornkul, 2022). This collaborative approach increases the likelihood of successful and sustainable reforms. In the context of higher education reforms, accountability and quality assurance are paramount. Visionary leaders are often at the forefront of establishing robust mechanisms for monitoring and evaluating the impact of reforms, ensuring that the changes made lead to improved educational outcomes and greater institutional accountability. The rapid pace of technological change poses both challenges and opportunities for higher education. Visionary leaders are key to navigating these changes, integrating new technologies into the educational experience, and preparing students for a digitally-driven world. Above discussion can be hypothesized as:

H_2: Visionary leadership has a significant impact on higher Education Reforms.

Higher Education Reforms and Higher Education Performance

Higher Education policy contains multiple factors. The following are the elements that assure the relationship with education performance.

Modern Curriculum and Higher Education Performance

Modern curriculum extends beyond textbooks, it shapes students' learning experiences, integrates diverse resources, and aligns with educational goals. The relationship between modern curriculum and higher education performance is multifaceted and crucial for shaping the learning experiences of students (Shafait et al., 2021). A well-structured and coherent curriculum enhances student learning outcomes by providing a clear path for knowledge acquisition and skill development that enhance HE performance. High-quality curriculum plays a pivotal role in improving student performance. Effective teaching practices, such as goal setting, peer tutoring, formative assessment, and evidence-based feedback, are integral components of quality curriculum (Irons & Elkington, 2021). When curriculum design aligns with evidence-based teaching strategies, it contributes to positive student outcomes. a well-designed, coherent, and responsive curriculum significantly impacts higher education performance, fostering student success and preparing them for the challenges of the future. It is hypothesized as:

H_3: Modern Curriculum has a significant impact on Higher Education Performance.

Quality Faculty and Higher Education Performance

The relationship between Quality Faculty and Higher Education Performance is pivotal in shaping the overall effectiveness of educational institutions (Iqbal et al., 2021). The author examines potential approaches to address the fundamental obstacles and endeavors to emphasize significant issues linked to higher education in Pakistan. Education has a pivotal role in the transformation of society, the cultivation of human capital, the promotion of political stability, and the facilitation of economic progress within a nation. The ability of Higher Education Institutions (HEIs) to generate graduates who are productive, talented, and competent is contingent upon their ability to provide education of standard and quality. This is contingent upon several factors, including their financial resources, faculty resources, favorable atmosphere, education delivery system, and policies (Arnhold & Bassett, 2021). Quality faculty members significantly impact student engagement and learning outcomes. Quality faculty members significantly impact student engagement and learning outcomes that influence HE performance (Qureshi et al., 2023). Students benefit from faculty who are passionate about their subject matter and committed to student success. quality faculty members play a central role in

shaping higher education performance. Their commitment to teaching, research, student interaction, and continuous improvement directly impacts student success and institutional excellence. This discussion is hypothesis as:
H_4: Quality Faculty has a significant impact on Higher Education Performance.

Research Promotion and Innovation Culture and Higher Education Performance

Muksin and Avianto (2021) identify aims to adopt a governance innovation policy that is new in current practice by One-Stop Integrated Services. Research promotion initiatives within universities encourage faculty members to engage in scholarly activities.When universities actively promote research through funding, grants, and incentives, faculty members are motivated to conduct high-quality research. Increased research productivity leads to a positive impact on the institution's reputation and academic standing (Khan et al., 2018; Lunag Jr et al., 2024). An innovation culture fosters creativity, risk-taking, and novel approaches to problem-solving.When universities cultivate an environment that values innovation, faculty members are more likely to explore new ideas, collaborate across disciplines, and seek unconventional solutions (Morawska-Jancelewicz, 2022). Research output and innovation contribute to an institution's reputation. High-quality research publications, patents, and successful innovation initiatives enhance the university's global standing. Positive rankings attract talented faculty, students, and research funding. a symbiotic relationship exists between research promotion, an innovation culture, and higher education performance. When universities prioritize both, they create an ecosystem that benefits faculty, students, and the institution as a whole. This can hypothesis as:

H_5: Research Promotion and Innovation Culture has a significant impact Higher Education Performance.

Quality Enhancement and Higher Education Performance

Khan et al. (2024) analyze Effective governance has a crucial role in enhancing and improving the well-being, quality of life, and overall standard of living of individuals within a society. However, regrettably, this issue has been a significant worry in Pakistan since its establishment. The presence of an interrupted democratic system, a dearth of accountability, pervasive corruption, and a lack of adherence to the rule of law have posed significant obstacles to the achievement of effective government in Pakistan. Furthermore, the lack of competence among politicians and bureaucrats, an unjust recruiting system, and a general absence of responsibility have had a detrimental impact on the effective provision of services to the general population. Pakistan is unable to achieve its future objectives due to this predicament (Hussain et al., 2023). Hence, it is imperative for Pakistan to implement tangible measures to guarantee political stability, transparency, expeditious public service provision, and responsiveness within its governmental institutions. In order to address the issue of corruption, abuse of power, and injustice in its institutions, it is imperative to establish a robust system of openness and accountability. This can hypothesis as:

H6: Quality Enhancement has a significant impact on Higher Education Performance

Internalization and Higher Education Performance

Internalization refers to the process by which institutions of higher education engage with global perspectives, cultures, and practices. It involves integrating international dimensions into various aspects of university life, including research, teaching, student experiences, and institutional policies. Abbasi et al. (2021) exploring and highlighting the role of higher education commission in promoting higher education in Pakistan in the global perspective. Internalization fosters collaboration across borders, leading to joint research projects, knowledge exchange, and innovation. Exposure to diverse perspectives enhances the quality of research and contributes to breakthroughs. Exposure to international contexts enriches students' learning experiences.

Interaction with peers from different backgrounds improves critical thinking, adaptability, and intercultural skills (de Hei et al., 2020). Students become better prepared for a globalized workforce. internalization positively influences higher education performance by enhancing research, student experiences, and institutional reputation. However, it requires thoughtful planning, inclusivity, and a commitment to global citizenship. This discussion hypothesized as:

H7: Internalization has a significant impact on Higher Education Performance.

Infrastructure Development and Higher Education Performance

Infrastructure in HEIs includes buildings, classrooms, laboratories, libraries, and equipment. A well-designed and maintained infrastructure creates a conducive learning environment. High-quality facilities enhance student experiences, facilitate better instruction, and contribute to improved learning outcomes (Asiyai, 2022; Osman et al., 2024). Higher education and economic development are strongly interlinked, with HEIs contributing to economic

growth by fostering education, skills, innovation, and production. This relationship underscores the importance of building technological capabilities within the educational sector to support economic development. State-of-the-art research facilities are essential for HEIs. Well-equipped labs, research centers, and technology infrastructure support faculty research (Qadoos & Atta, 2023). Cutting-edge facilities attract top researchers and foster innovation. Infrastructure must evolve to accommodate technological changes. High-speed internet, smart classrooms, and digital libraries are essential for modern education. HEIs with adaptable infrastructure stay relevant in a dynamic educational landscape surly uplift the HE performance. In summary, infrastructure development directly influences HEIs' performance by shaping the learning environment, supporting research, and contributing to institutional success.

H_8: Infrastructure Development has a significant impact on Higher Education Performance

Disrupting Technology Mediate the Relationship between Higher Education Reforms and Higher Education Performance

The mediation of disruptive technology in the relationship between higher education reforms and higher education performance highlights several key arguments, emphasizing the transformative and often disruptive nature of technology in HEIs. Technological changes have a significant and positive impact on academic performance, mediated through increased student engagement. This suggests that the introduction of new and disruptive technologies in higher education institutions can foster an environment that enhances learning outcomes by engaging students more effectively (Lin et al., 2023). Disruptive technologies, while not initially designed for educational purposes, hold considerable potential for enhancing learning and teaching. These technologies can significantly alter traditional educational practices, suggesting a need for higher education institutions to adapt to these changes to improve educational outcomes (Osman et al., 2024). There is a notable discrepancy between the technologies provided by higher education institutions and those actually used by students and staff. This implies that individuals prefer to use simpler and more convenient technologies, often external to the institution's offerings, to support their learning and teaching activities. Such behavior underscores the importance of institutions recognizing and integrating disruptive technologies that align with the actual preferences and practices of their communities (Hamed et al., 2022).

H_9: Disrupting Technology Mediate the Relationship between Higher Education Reforms and Higher Education Performance.

Method

Research Approach

This study follows the post-positivism theory and deductive approach. This study examines Higher Education Performance in the era of disrupting technologies. A quantitative approach is used in this research. However, the study population consists of research scholars and faculty members of different universities, due to which a convenience sampling technique has been used. The sample size is calculated using Taro Yamane's formula as the estimated number of research scholars and faculty members of different universities is about 1600, so the sample size should be around 240 to obtain reliable data (at a 95% confidence level and a 5% error level) (Luanglath & Rewtrakunphaiboon, 2013) .

Data Collection

The quantitative data collection method includes the survey of research scholars and faculty members of different universities. Moreover, an online questionnaire is also used to gather data. The link to that questionnaire was emailed to the research scholars and faculty members of different universities with a formal request to participate. The questionnaire used in the study is the adapted version to survey the research scholars and faculty members of different universities in Karachi. The questionnaire was divided into two parts; one consists of the respondents' demographic information, while the other consists of the five-point Likert scale questions that measure the variables used in the paper. However, responses were taken through google.docs for primary data collection.

Instrument

Data was collected through questionnaires composed by researchers mentioned in Table 01. The questionnaire consists of 5 variables, namely Sustainable Good Governance (SGG); Visionary Leaders (VL), Higher Education Reforms (HER); Higher Education Performance (HEP); Disrupting Technology (DT).

Table 1

Measures of Questionnaire

S.no	Variables	Items	Author
1-	Sustainable Good Governance	3	Ramzy et al. (2019)
2-	Visionary Leaders	3	Manning and Robertson (2002)

3-	Higher Education Reforms	8	Bibi et al. (2021)
4-	Higher Education Performance	3	Amin and Khan (2009)
5-	Disrupting Technology	3	Bower and Christensen (1995)

Data Analysis

The statistical technique used in this study was Smart PLS (3), which utilizes partial least squares modeling (PLS-SEM) to analyze the data. The rationale for selecting this analytical methodology is based on the specific attributes of the data and sample, as well as the study of moderation and mediation. This technique has gained significant recognition in the realm of research pertaining to human resource management, marketing, and other associated domains. The use of PLS-SEM was suggested by Hair Jr et al. (2021) as a means to forecast the impact of the dependent variable. In a similar vein, Moon and Russell (2008) argued that the technique is appropriate for forecasting the set of equations in the proposed research model and establishing connections between variables simultaneously. PLS-SEM is used in this work as a verified methodology for doing comprehensive analysis in the area of management science. Structural Equation Modeling (SEM) is a multifaceted data exploration approach that has been theoretically created to investigate linear and additive random correlations. This enables researchers to examine the interconnections among various components. SEM is often regarded as the most effective method for quantifying both direct and indirect routes due to its ability to assess latent structures that are challenging to investigate and cannot be directly seen. Structural Equation Modeling (SEM) encompasses both inner and outer model techniques, which are used to investigate the associations between independent and dependent variables, as well as between latent factors and their observable indicators. PLS primarily emphasizes the examination of variation that may be conducted using Smart PLS. Hence, this methodology has been selected for our research.

Results

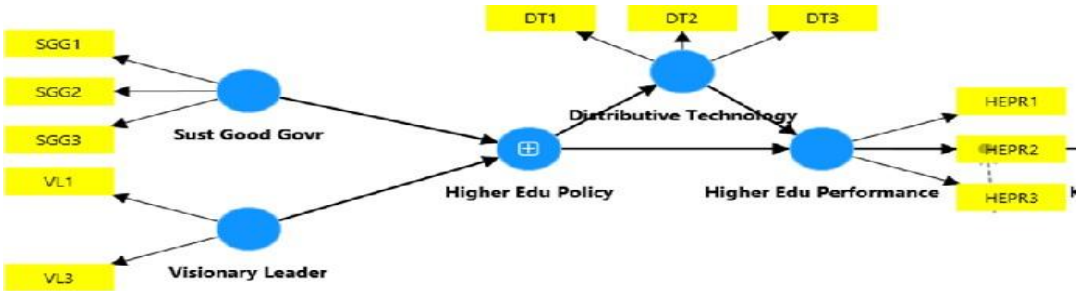
Descriptive Statistics

The research findings begin with a brief demographic profile of respondents regarding gender, age, and qualification. Respondents collected a total of 240 data. Of the gender, 144 respondents (60 percent) were male, whereas 96 were female (40 percent). However, in the age, 84 of the respondents (35 percent) belonged to the age of 25-30 years, 83 respondents (34.6 %) were aged between 30-35 years, 59 respondents (26.6 %) belonged to the 36-40 age group, and only 14 respondents (5.8%) belong to above 40 years of age group. In the current qualification, 211 of the respondents (88.3 percent) were doctorate, 29 of the respondents (11.7 %) were post graduates.

Path Modeling

When structural equation modeling (SEM) software is employed, "path Models" are assumed to be utilized to ostensibly demonstrate the hypothesis and variables under evaluation (Hair, Ringle & sarstedt, 2011). In this study, we provide a second-order construct model. In order to generate higher-order models or hierarchical models of components (HCMs), PLS-SEM often necessitates the examination of second-order models that include two-layer building structures (Becker, 2012). In structural equation analysis, a second-order structure may be used to get the fit-to-data model instead of excluding multidimensional measurements. Multidimensional measures that were established prior to the emergence of structural equation analysis may be effectively used via the application of structural equation testing (David & Gerbing, 1994).

Figure: 2 Structural Model of the study



Measurement Modeling

CFA was used in the present study to assess the measurement model (Hair, 2012). The measuring (outer) model was first evaluated by an examination of content, convergence, and discernment. The Cronbach Alpha coefficient may be used to evaluate the reliability, validity, and average variance (AVE) obtained, hence assessing internal consistency reliability. The Likert scale is the most precise measure of dependability. According to (Robinson & Henderson, 2019), the minimum acceptable internal consistency value is 0.07. Table 1 illustrates that the Cronbach Alpha values for all indicators above the threshold of 0.7, providing clear evidence that the dependability of consistency remains intact. Composite reliability is a method used to assess the overall dependability of a set of elements that are loaded onto a latent construct. The value is somewhere between 0 and 1. As a result, zero is the lowest value, and one is the highest.

Table 2

Confirmatory Factor Analysis (CFA)

Construct	Items	Loadings	AVE	CR	CB alpha
Sustainable Good Governance	SGG1	0.65			
	SGG2	0.75	0.52	0.72	0.77
	SGG3	0.71			
Visionary Leaders	VL1	0.68			
	VL2	0.75	0.57	0.75	0.80
	VL3	0.77			
Higher Education Reforms	HER1	0.61			
	HER2	0.79			
	HER3	0.81			
	HER4	0.532	0.50	0.71	0.76
	HER5	0.403			
	HER6	0.832			
	HER7	0.758			
	HER1				
Higher Education Performance	HEP1	0.66			
	HEP2	0.65	0.51	0.71	0.76
	HEP3	0.71			
Disrupting Technology	DT1	0.72			
	DT 2	0.77	0.56	0.75	0.80
	DT3	0.69			

Table 2 also shows the value of composite reliability, which is above 0.70, which indicates there is no issue regarding the composite reliability

Table 3

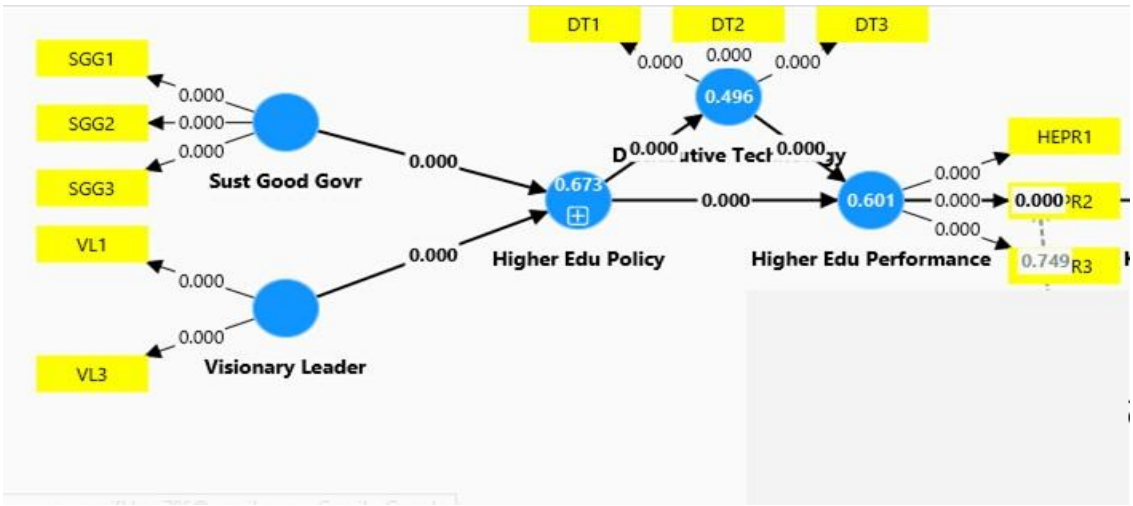
Fornell-Larcker Criterion

	Sustainable Good Governance	Visionary Leaders	Higher Education Policy	Higher Education Performance	Disrupting Technology
Sustainable Good Governance	***0.71***				
Visionary Leaders	0.65	***0.74***			
Higher Education Policy	0.54	0.39	***0.71***		
Higher Education Performance	0.49	0.51	0.54	***0.74***	
Disrupting Technology	0.43	0.45	0.39	0.65	**0.75**

For example, the assessment of the dependability of concepts and indicators involves the use of convergent validity and consistent reliability. The Average Variance Extracted (AVE) was introduced by Fornell and Larker in 1981. Convergent validity is often used for assessment purposes. The cutoff value for the average variance extracted is 0.50. In convergent validity, the square root of the average variance extracted (AVE) is compared to the inter-construct

correlation. The value of the AVE should exceed 0.50. The average variance extracted (AVE) for each construct must exceed the predetermined variance of 0.50 in order to account for the measurement error associated with that particular construct. The AVE values shown in Table 2 exceed the threshold of 0.6, indicating that the convergent validity of the data remains unaltered.

Figure 3 Measurement Model



Structural Model Analysis

The structural model was subjected to analysis in order to investigate and evaluate the association between the components. This section facilitates the examination of the impact of relationships on constructs. The psl-sem-sam approach is used to partition the data into sub-samples and ascertain the significance level by calculating pragmatic T-values and P-values. Hair (2012) argues that in order to draw an impartial and accurate conclusion, it is essential to have a large sample size. Failure to do so may lead to erroneous and specious findings. Furthermore, he suggested use bootstrapping for a subsampling of 5000. For this study, 5000 sub-samples were used in bootstrapping with a significance threshold of 5%. The findings are shown below the Table 4:

Table 4

Path Analysis

	Original Sample (o)	Sample Mean (M)	Standard Deviation (STDVE)	P Values	Alternate Hypothesis
Direct Effect					
SGG -> HER	0.263	0.224	0.081	0.006	supported
VL -> HER	0.156	0.543	0.052	0.021	Supported.
MC -> HEP	0.104	0.103	0.052	0.012	supported
QF -> HEP	0.442	0.636	0.085	0.000	supported
RP -> HEP	-0.080	-0.040	0.189	0.003	supported
QE -> HEP	0.175	0.189	0.138	0.000	supported
Internalization -> HEP	0.256	0.443	0.012	0.001	supported
ID -> HEP	0.130	0.432	0.172	0.031	supported
Indirect Effect					
DT x HER -> HEP	0.009	0.035	0.175	0.002	supported

Bootstrapping determines empirical T-values and P-values using the two-tailed method when the significance level is 5%. Rejecting the null hypothesis requires a T-value more than 1.96 at the 5% level of significance, which is considered significant, and a P-value lower than 0.05, according to the standard measurement of T-values. As noted in section 2 of this article, all null hypotheses indicated a positive association between the constructs. Accordingly, if P-values are less than 5%, the null hypothesis will be rejected, and the alternative hypothesis will finally be accepted.

Discussion

Every person has an inherent and fundamental need for education. The goal of higher education is to help students and learners enhance their strengths, competencies, and abilities. This study set out to investigate sustainable good governess and visionary leadership on higher education performance through higher education reforms at universities located in Karachi, Pakistan.

First Hypothesis of the study stated that Sustainable Good Governess has a positive significant relationship with the Higher Education Reforms. According to the above results, hypothesis is supported as significant value shows 0.006 ($P < 0.05$). A variety of studies have proven the strength of the relationship between organizational commitment and performance, however it varies. According to Pizzutilo and Venezia (2021) , Flexibility, accountability, and a forward-thinking mindset are key components of sustainable good governance, since they enable higher education establishments to quickly adjust to the fast evolving global knowledge economy. Institutions adopting these forms of governance will be in a better position to adjust their research agendas, curriculum, and operational strategies in order to match international standards and tackle modern issues. The perception and integration of sustainability in educational institutions are greatly influenced by governance, which also has an impact on management choices and institutional activities. Second Hypothesis of the study stated that Visionary Leadership has a positive significant relationship with the Higher Education Reforms. According to the above results, hypothesis is supported as significant value shows 0.021 ($P < 0.05$). scholar validated the relationship as, Forward-thinking leaders understand the value of a creative curriculum that tackles today's problems and job concerns. Higher education may experience major transformations via visionary leadership, including the introduction of new programs, teaching pedagogies, and technology that are crucial for equipping students for the future (Miller & Ives, 2023).

Third Hypothesis of the study stated that Modern Curriculum has a positive significant relationship with the Higher Education Performance. According to the above results, hypothesis is supported as significant value shows 0.012 ($P < 0.05$). Higher education that incorporates a contemporary curriculum encourages a profound engagement with knowledge that stresses the learning experience as much as information acquisition. Modern curricula strive to cultivate in students desirable dispositions and abilities like creativity, flexibility, and critical thinking by including them in the process of learning (Lin et al., 2023). Fourth Hypothesis of the study stated that Quality Faculty has a positive significant relationship with the Higher Education Performance. According to the above results, hypothesis is supported as significant value shows 0.012 ($P < 0.05$). Employers place a high value on the personal traits of graduates, but excellent faculty provide the groundwork for these qualities to flourish via effective mentorship and instruction. This emphasizes how important faculty members are in guaranteeing student happiness as well as equipping students with employability skills and making a positive impact on society (Tang, 2019). As a result, higher education institutions perform better in terms of graduate employability and societal contribution.

Five Hypothesis of the study stated that Research Promotion and Innovation Culture has a positive significant relationship with the Higher Education Performance. According to the above results, hypothesis is supported as significant value shows 0.003 ($P < 0.05$). The establishment of an innovative culture at public higher education institutions is crucial for tackling institutional and management obstacles in research and development (R&D). A supportive atmosphere for research is cultivated by factors including creativity, adaptability, and resources for innovation in addition to mentorship and training (Akour & Alenezi, 2022). This culture helps overcome obstacles related to research and development (R&D) activities, which greatly improves HEI performance in terms of research productivity and the creation of new knowledge. Six According to the study's hypothesis, there is a positive and statistically significant association between quality enhancement and the performance of higher education. Given that the significant value is 0.000 ($P < 0.05$), the hypothesis is supported by the findings shown above. Improving learning materials and employing innovative teaching approaches are two examples of quality improvement projects that higher education institutions may undertake to boost their reputation and gain a competitive edge. Institutions may increase their marketability and attractiveness by embracing a culture of continual quality improvement, which will enable them to better fulfill the changing demands of both employers and students. In turn, this improves the school's performance by attracting more qualified teachers and pupils (Murtaza & Hui, 2021).

According to the study's seven hypotheses, there is a positive and statistically significant association between internalization and academic performance in higher education. Given that the significant value is 0.001 ($P < 0.05$), the hypothesis is supported by the findings shown above. Internationalization in higher education makes it easier for teacher and student mobility, academic cooperation, and knowledge exchange—all of which are essential for improving the quality of education. By promoting intercultural competence and integrating global perspectives into the curriculum, schools may provide their pupils a richer and more well-rounded education (Zheng et al., 2024). Eight Hypothesis of the study stated that Infrastructure Development has a positive significant relationship with the Higher Education

Performance. According to the above results, hypothesis is supported as significant value shows 0.031 ($P < 0.05$). Modern labs, research centers, and classrooms are examples of the physical infrastructure that has been developed. These facilities have a direct impact on the quality of education provided and the institution's capacity to draw in top-tier staff and students. In addition to facilitating efficient learning and teaching, well-planned and furnished physical spaces also create an atmosphere that is favorable for academic research and innovation (Bibi et al., 2021).

Nine Hypothesis of the study stated that Disrupting Technology Mediate the Relationship between Higher Education Reforms and Higher Education Performance. According to the above results, hypothesis is supported as significant value shows 0.031 ($P < 0.05$). Artificial intelligence, blockchain, and cloud computing are examples of disruptive technologies that improve institutional agility and expedite administrative procedures. Higher education institutions may use these technologies to automate repetitive operations, manage resources more effectively, and enhance decision-making by using insights from data. Institutions may improve the student experience, reallocate resources to core educational activities, and react faster to market needs and new trends in education by reorganizing their operational procedures to include these technologies (Bower & Christensen, 1995). Adopting disruptive technologies boosts operational efficiency and agility, which in turn boosts the overall performance of the organization. Among these benefits are more flexibility, more financial security, and a more formidable position in the competitive higher education market (Charnitski, 2002).

This paper identified the possibility for universities to use disruptive technology as a transforming tool in social impact and educational innovation. Although the focus of this research was on visionary leadership and sustainable governance as enablers of higher education reform, we also considered how the adoption of disruptive technologies such as artificial intelligence (AI), blockchain, and virtual/augmented reality could fundamentally change the educational environment. This research technique showed that colleges may foster a culture of ongoing innovation by including disruptive technologies in their curricula. This not only gets students ready to succeed in a fast-paced environment but also gives them the tools they need to drive society's effect, therefore matching educational objectives with more general social and economic demands.

Practical Implication

This research proposed some modifications to enhance academic achievements in higher education. In order to effectively respond to the ever-changing global knowledge economy, higher education institutions (HEIs) should prioritize the development of governance frameworks that place a strong emphasis on accountability, flexibility, and innovation. Furthermore, educational institutions should proactively identify and assist upcoming leaders who possess the ability to stimulate progress in the development of curriculum, teaching methods, and the incorporation of technology. Consequently, pupils will be more prepared to tackle forthcoming possibilities and problems. Additionally, it is imperative for higher education institutions to consistently update their curricula to incorporate novel subjects and pedagogical methods that promote innovation, adaptability, and critical thinking. The educational process will be improved, and students will be more adequately equipped to meet the requirements of the contemporary labor market. HEIs should promote international collaboration and mobility to enhance the educational experience by fostering intercultural skills and global views. The quality of education will increase, resulting in pupils being more prepared for a global society.

Institutions of higher learning need to set up structures for the best possible distribution of resources. Institutions may effectively manage infrastructure, money, and human resources by using data-driven models, guaranteeing growth without going over budget. Learning and innovation are supported by maintaining modern physical and digital infrastructure, such as research laboratories and smart classrooms. A flexible learning environment that satisfies modern needs may be produced with strategic investments in these areas. Financial stability may be ensured by creating policies that emphasize varied income sources, such as grants, collaborations, and technology commercialization, which will allow institutions to finance expansion plans in a sustainable manner.

Conclusion

This research sought to enhance the performance of universities by integrating sustainable good governance, visionary leadership, and reforms, despite the constant impact of disruptive technologies. Visionary leaders are essential in the development and execution of HEI policies due to their ability to stimulate innovation and offer strategic direction. They have a crucial role in drawing attention to unforeseen concerns, delineating explicit objectives, and obtaining financial support and endorsement for policy efforts. Leaders with a visionary approach at Higher Education Institutions (HEIs) not only encourage a mindset focused on growth and a dedication to constant enhancement, but they also ensure that the institution's policies align with its purpose and values, so significantly boosting its overall performance.

Moreover, the research supports the idea that higher education institutions (HEIs) may enhance their policies by implementing sustainable good governance, which involves enhanced openness, accountability, and adaptability. Strong governance mechanisms ensure that policies have a significant and enduring influence, allowing for an effective reaction to evolving global trends and educational requirements. HEIs can have influence on policymakers by prioritizing long-term aims and ethical issues through their emphasis on sustainability in governance. Moreover, the current study has shown that Pakistani institutions have the ability to enhance society and the economy by adopting cutting-edge technologies like blockchain, artificial intelligence (AI), and cloud computing. By incorporating these technologies into their curriculum and research, colleges might potentially improve students' job prospects and foster their innovation by providing them with the necessary skills for the digital economy. In order to enhance social welfare and promote economic progress, universities can engage in partnerships with companies to offer technologically advanced solutions to address societal challenges.

Limitations and Future Direction

This study has some drawbacks. Firstly, examining methods by which universities might utilize disruptive technologies to drive educational innovation and have a significant influence on society. Furthermore, this paper examines the strategies for implementing a culture of research and innovation. However, it is crucial to investigate efficient approaches for managing resources, such as finances, infrastructure, and human resources, in order to facilitate the growth of the higher education sector. Further research is necessary to determine the methods through which universities might contribute to the advancement of a knowledge-driven society in Pakistan while also tackling social and economic concerns. The utilization of convenience sampling in this study may restrict the capacity to apply the findings to a wider community of research researchers and faculty members. Additionally, the computation of the sample size relies on an approximation, and the actual rate of response may impact the dependability and accuracy of the findings. The study's cross-sectional design may not adequately represent the dynamic fluctuations in higher education performance over time.

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