



## The Moderating Role of Digital Innovation between Digital Leadership, learning and Sustainable Performance among Small and Medium-Sized Firms

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### Abstract

This research effort explores the role of digital leadership, learning and innovation in influencing sustainable performance among small and medium enterprises. Digital leadership and learning have been considered as exogenous constructs to predict sustainable performance, and digital innovation is incorporated as a moderator variable to assess the relationships. This study bridges the research gap in explaining the role of digital leadership, which is an untapped research area for explaining sustainable performance. Similarly, digital learning is an essential element in sustainable performance. Further, digital innovation plays an effective and striking role in adopting and implementing technological advancements to achieve organizational goals. The researcher focused on the SME sector of Punjab, Pakistan to investigate the hypothesized relationships between variables. The convenience sampling technique was applied and G\*Power was utilized to select the sample. Later, Smart-PLS was utilized for analysis. The results revealed that digital leadership remains insignificant in predicting sustainable performance. Digital learning and digital innovation were significant in influencing sustainable performance. Moreover, digital innovation moderates the relationship between digital learning and sustainable performance, but no moderation effect was observed between digital leadership and sustainable performance. Implications, future research avenues, and limitations of the study are given at the end of this paper.

**Keywords:** Sustainable Performance (SP), Digital Leadership (D\_LS), Digital Learning (D\_LR), Digital Innovation (D\_INN), Small and Medium Enterprises (SME)

### 1. Introduction and Background

The phenomenon of sustainability has gained the attention of researchers for its crucial significance in predicting performance-related consequences in the recent decade. Every business strives to survive in the intense competition, rapidly changing and turbulent environment. The phenomenon of sustainability is defined as the development aspect for meeting the requirements of the existing generation without sacrificing the needs of future generations, the organization has the capability of creating profit for stakeholders and the ability to enrich the lives of the participants while focusing on the environmental concerns (Gerasimova, 2017). Sustainable performance includes the activities that socially impact the useful life of an organization, strengthen the ability to resume and sustain the ability of the living on the earth, maintain the welfare, and self-sustenance of society, provide the safety of all the living creatures and solve the problems, personal freedom and participation of the current and future human generations (Žak, 2015). Today, in the rapidly changing and competitive business environment, every organization is trying to achieve sustainable performance as it is an important part and stakeholder expectations. This is an empirical way to decrease the environmental impacts enhance the performance of the organizations, and enrich the values of the business firms. It is very difficult to incorporate sustainable performance without measuring the present condition of the organization. Companies that are in global competition need to report progressively and achieve sustainable performance by taking effective initiatives such as technological innovation to accomplish the task (Mohd Suki, 2017).

Organizations are trying to create benefits by focusing on economic initiatives and enhancing the stakeholder's wealth while emphasizing social concerns and environmental concerns to enrich the greater benefits of society. The environmental, economic and social aspects of the performance are generally referred as sustainable performance by various researchers. These focuses enable the firms to increase the financial benefits to enrich the sustainable performance, and gain the competitive advantage (Du et al., 2022; Gong et al., 2018). The environmental perspective of the organizations presents the positive impact on the natural environment within the organization and its influence on the external environment that consistently sustains environment-friendly activities. It allows the firms to decrease air pollution, the effective use of energy resources, the effective utilization of material and compliance with the environment standards (Laosirihongthong et al., 2013). If the organization wants to improve its business advantage, it must emphasize innovative practices; the innovative practices is a pattern that derives the sustainable performance and competitive advantage of the economic development of the industry and for the nations (Chen et al., 2018). Economically sustainable performance occurs when the firms strengthen their position in the market and gain a competitive advantage, increasing the financial benefits of return on investment (Eltayeb et al., 2011). To promote environmental-friendly products, goods and services, firms are required to use materials that would not damage the environment or not create pollution in the air, use less energy that could heat the air, we should use reused water and focus on packaging that reused, recycled and will not harm the environment (Abdul-Rashid et al., 2017; Delai & Takahashi, 2016). If the organizations achieve the competitive advantage and effective performance of the organization, they should promote social performance, environmental performance and economic performance to survive the changing environment and competition. Social performance is to provide job security and the well-being

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of the employees to build relationships within the employees and promote a working environment, providing better living conditions for society (Afum et al., 2020).

Prior literature has identified the three dimensions of sustainable performance as discussed below:

Environmental sustainability deals with the effective use of available resources and maintaining environmental protection for the next generation (Abdul-Rashid et al., 2017). Environmental sustainability focuses on the quality and quantity of natural resources, promoting a better environment, universal warming, and related to the living things or organisms that do not harm the environment, efficient use of waste and provide alternate energy production, improved pollution and energy emission (Young et al., 2008).

Social performance is the desired need of the firms to improve and take such decisions that promote a better environment and the good quality of life of the employees without damaging the environment, working for the betterment of the employees and for the community, promoting corporate culture in the firm, the relationship between the workers and the stakeholders will improve the sustainable performance and productivity of the organization. social performance measures to contribute to the community and the rules and regulations provided by the government and the laws (Jain et al., 2016; Rezaee, 2017). If the organization follows the rules and regulations given by the government and the laws the social performance has the ability to create the good image of the company and the higher productivity of the firm (Croom et al., 2018).

The hard situation of every successful firm is to maintain economic sustainability; the firm financial position and market shares depend on the economic situation of the organization (Song et al., 2019). Manufacturing cost, product quality, the response of the organization and providing a flexible environment to workers are the measurement of economic performance (Singh et al., 2016). If the current generations fulfill their responsibilities effectively and efficiently and take appropriate decisions and actions then economic sustainability guaranteed the success of the future generation (Miemczyk & Luzzini, 2018).

Sustainable leadership refers to effective leadership, sustainable leadership focuses on the creation of the profits for the firms and enhances the current and future performance and productivity of the organizations in the future by providing the quality of life for all the shareholders in addition. Sustainable leadership influences sustainability values at the person level, organizational level and social level (Gjerde & Ladegård., 2019). Leaders focus on capacity building, the rapidly sustainable changing environment and long-term planning which results make the competitive advantage of the organizations to achieve sustainable performance development goals (McCann & Holt, 2010). Sustainable leadership practices such as valuing the employees and building strong relations with the employees make long-term sustainable performance; sustainable leadership significantly increases the performance of the organization. Sustainable leadership tends to predict the development of firm's learning and increased performance (Arocena & Sutz., 2021).

Digital learning was introduced by Cross Jay in 1999 (Yoon et al., 2012); in the advancement of technologies and digital applications, it is defined in different ways such as distance learning, online learning, e-learning, network learning, internet-based training, web-based training (Holzberger et al., 2013). The aim of digital learning is to give learning through different digital tools such as texts, images, and material provided through the internet, develop the teaching skills to influence the learners learning and purpose to develop teaching effectiveness and enhance the knowledge and the essential technical skills (Kaklamanou et al., 2012). Digital learning is a learning application that is described as obtaining the learning material or content for online and offline learning activities through wire and wireless networks (Hockly, 2012). The development of digital learning it changes the old traditional teaching process to new teaching styles and modes and provides the strengths (Miyoshi et al., 2012).

With the development of digital technologies in the economy, various firms incorporate, implement and promote change with digital innovation. Previously, the role of digital innovation and its positive impact on organizations, the essential uniqueness of digital technologies and its flexibility in the working environment. The researchers have also determined how these advanced technologies grab the opportunities to create the latest infrastructure and product improvement, business structure and how to resume the exciting business and focus to create innovation within the firms. The concept of digital innovation is defined as creating new ways to reform the exciting business structure process that is result of the digital technologies (Nambisan et al., 2017).

This study contributes to explaining the phenomenon of sustainable performance as prior literature has defined it with various factors, but this study stressed digital leadership and digital learning to explain sustainability. It is intended to explore the moderation effect of digital innovation between exogenous and endogenous constructs.

## 2. Literature Review

### 2.1. Digital Leadership and Sustainable Performance

Leadership can redirect and be owned by someone to influence, motivate, encourage, invite, guide, give direction and force the employees and the teams to adapt the technological change and do the right things that help the individuals to achieve the objectives and goals that are set by the organizations. Leader has the capacity to encourage and give direction to their employees on how to achieve the firm objectives and goals (Soliman et al., 2020). If the leader can run out the tasks and functions efficiently of the organization appropriately it is not easy for the firms to accomplish their goals; the leader has the ability to influence the employees in the organization to their behavior and attitude, it is an integral part that every organization required (Wulandari et al., 2021). Researchers have focused on the concept of digital leadership due to its long-term benefits in this digital and technological era. The purpose of digital leadership

is to guide and motivate employees on how to use advanced technologies and digital applications in the organizations, the effective use of resources, and how to reduce cost and time in this sense, digital leadership plays an integral role in increasing the performance and the productivity of the firm and the employees (Nikmahtun, 2022).

Due to the high competition and development in the technological era, small and medium-sized enterprises are trying to achieve a competitive advantage (Puriwat & Tripopsakul, 2021). The prior study has expressed the impact of social media utilization and innovation skills on enhancing the productivity and performance of SMEs. Social media applications impact innovation capabilities as reported in the literature, and they also influence the sustainable performance of organizations when it is mediated by innovation capabilities and moderated by digital leadership (Borah et al., 2022). Another research effort has been made to determine the complex relationship of digital leadership based on dynamic capabilities; results of the study show that digital leadership based on dynamic capabilities has direct and indirect impacts on innovation (Mihardjo et al., 2019). Previously, researchers have determined the relationship between digital leadership and innovative work behavior in the context of the textile industry. The findings of the study indicated that the perceptions of the employees related to digital leadership have a significant impact on all dimensions of innovative work behavior (Erhan et al., 2022).

The above literature derives towards hypothesized statement:

**H1: Digital leadership influences the sustainable performance of SMEs of Pakistan**

**2.2. Digital Learning and Sustainable Performance**

Digital learning is defined as online learning and e-learning, is the utilization of digital technologies and the internet to increase the performance and learning process, it includes different applications such as electronic devices, tablets, computers and smartphones, online courses, interactive multimedia content, virtual classrooms, digital resources, learning management system, educational applications along with the digital technologies and tools help to provide the educational material and develop the learning process (Kaklamanou et al., 2012). Previously, the researcher has investigated the role of digital learning on sustainable development in the higher education sector in Saudi Arabia. The findings of the study revealed that digital learning has attracted the attention of the researchers as effective learning during the pandemic situation in post-COVID-19. The study also indicated the significance between digital transformation performance and higher education institutions in Saudi Arabia. The findings revealed that digital learning is essential to enhance the organization's sustainable performance (Alotaibi, 2022). Another research effort has been made to investigate the students' perception of digital learning; findings of the study showed that digital learning is significantly positive to the performance of the students, and the perception of the students about the digital learning tools is higher as compared to the old traditional teaching method. The student's performance and productivity increase due to the usage of digital learning rather than old traditional methods (Lin et al., 2017). Prior literature has explored problem-solving skills by using problem-based digital learning; it is indicated performance of the students is higher who used digital learning technologies as compared to others who do not use any learning technology.

The following hypothesis is derived on the basis of the above literature and arguments

**H2: Digital learning influences the sustainable performance of SMEs of Pakistan**

**2.3. Digital Innovation and Sustainable Performance**

The use of digital technologies, applications and, strategies to improve the business process modules, and product services refers to digital innovation. In the development of technologies, digital innovation brings significant change in the business process, reshaping the existing business process and various aspects of the organizations. Digital innovation is derived from diverse technologies such as IoT, cyber security, cloud computing, big data and machine learning (Bukht & Heeks, 2017). Digital orientation is explored in the literature, and digital platforms and the Internet of Things predict the digital economy that is required in a frugal environment. It has been stated that digital orientation, IoT and digital platforms are integral parts of the organizations or influence sustainable digital innovation. The study also determined the mediating impact of the digital platforms between digital platforms, IoT and sustainable digital innovation. The findings of the study suggested that organizations need to develop digital platforms to increase the productivity and performance of the organizations (Yousaf et al., 2021). Another research effort has been done to investigate the impact of digital orientation and digital capability on digital innovation, the study also investigates the mediating effect of digital innovation, digital orientation, organizational performance and digital capabilities. The findings of the study demonstrated the positive impact of digital orientation and capabilities on performance through the mediation effect of digital innovation (Khin & Ho, 2018). The above literature leads to the following hypothesized statement:

**H3: Digital innovation influences the sustainable performance of SMEs in Pakistan**

**2.4. Moderation role of digital innovation**

This study entails a discussion on the relationship between digital learning, leadership and sustainable performance with the moderation effect of digital innovation. The researcher argues that digital innovation tends to strengthen the relationship of digital leadership and sustainable performance, digital innovation also moderates the relationship by strengthening it between digital learning and sustainable performance. This is due to the nature of the variables. The mediation effect of knowledge sharing has been explained to determine the innovative work behavior and performance of the knowledge sharing; the finding of the study revealed that the network capabilities play a significant role in enhancing the productivity of the energy context, which leads towards the innovative work behavior. It is examined in the literature that the moderating role of digital innovation is between networking capabilities and

innovative work behavior. The results of the study show that network capabilities has a significant impact on innovative work behavior, and the moderation role of digital innovation in the energy domain increases the relationship between network capabilities and innovative work behavior (Binsaeed et al., 2023).

Previously, literature has incorporated the moderator role of innovation capabilities to explain the phenomenon of export intensity among small and medium enterprises. The study stressed the firm's innovation and digital capabilities that affect the external factors. The innovative capabilities enable the firms to create new knowledge and generate new processes, services and products. So, therefore, it has been observed that the innovation approach must be embedded in routine practices. The study also investigated the moderation effect of digital transformation that was found to be significantly influential in improving digital processes through the utilization of the internet, cloud computing, robotics, analytics and blockchain. The study reported that digital transformation is expected to play an important role in moderating the relationship between institutional constraints and exports (Su et al., 2022).

Previous literature has overlooked the crucial factor of digital innovation and its role in determining performance-related outcomes. Therefore, this study bridges the gap by expressing the moderating impact of digital innovation to explain sustainable performance influenced by digital leadership and digital learning. This study argues that digital innovation has the tendency to increase the relationship intensity between digital leadership and learning to explain the sustainable performance.

Following moderating hypotheses are developed:

**H4: Digital innovation moderates the relationship between digital leadership and sustainable performance**

**H5: Digital innovation moderates the relationship between digital learning and sustainable performance**

### 2.5. Research Framework

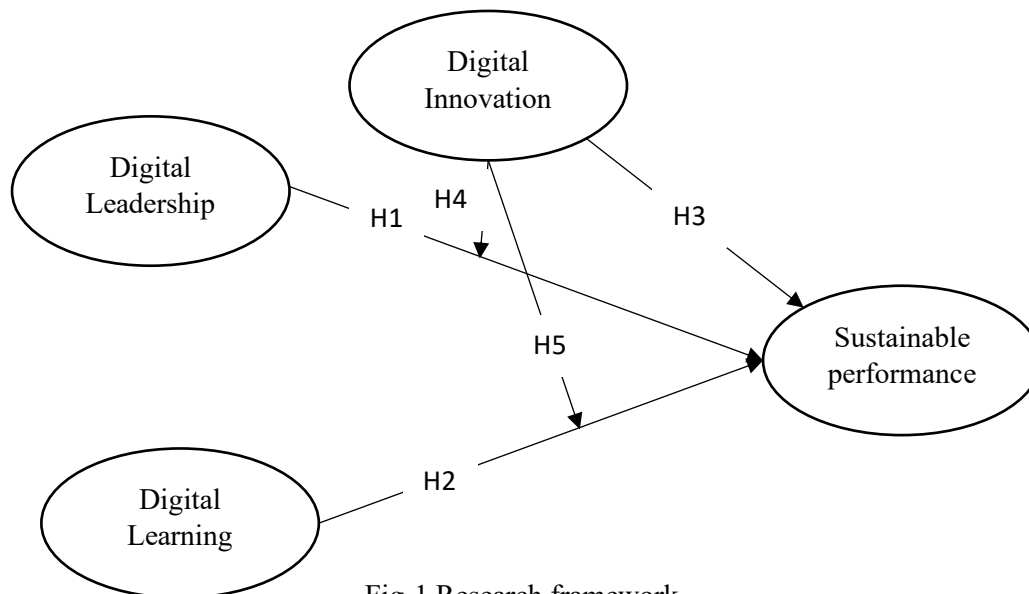


Fig-1 Research framework

### Research Methodology

The quantitative approach has been incorporated for research as data was collected cross-sectionally from the SME sector of Punjab from different and diverse industries. Mainly, the data was collected from the cities of Faisalabad, Gujranwala, Gujrat, Lahore, and Sialkot, which are considered as the industrial zones consisting of hubs of small and medium enterprises. The current research aims to determine the sustainable performance of SME sectors influenced by the exogenous constructs including digital leadership and digital learning with moderating role of digital innovation. Digital leadership and learning are argued to be crucial in determining sustainable performance. The researcher also claims that digital innovation moderates the relationship by strengthening the relation.

The unit of analysis in this study is the firm. Managers were approached for data collection to obtain their views on digitalization and sustainable performance. The G\*Power program was employed to ensure a sufficient sample size. There were four variables in the framework, and the 'rule of thumb' is to multiply 10 times, so the required sample size is 40 based on the statistical parameter (Faul et al., 2007). In anticipation of a lower response rate, the researcher distributed more questionnaires, which is a common practice. It is suggested to increase the sample size by 50% to ensure higher responses (Salkind & Salkind, 1997). After increasing the sample size to 60, questionnaires were distributed. It is tough to collect the responses due to the lack of interest of SME owners; the researcher decided to apply the convenience sampling technique for data collection as a smaller number of firms were interested in participating survey due to time and job constraints. The study utilized the questionnaire adopted from different previous studies.

### 2.6. Measurement Scales

The 17-item measurement scale of sustainable performance was used from (Mousa & Othman, 2020). The six-item scale to measure digital innovation was used from the study of (Zeng et al., 2022). The six-item measurement scale

of digital leadership is adopted from (Oktaysoy et al., 2023). The four-item measurement scale of digital learning was taken from the paper of (Abu Afifa & Nguyen, 2022).

**2.7. Analysis and Discussion**

This section entails analyzing the collected data. First, the response rate is presented. In the second stage, Measurement Model Assessment (MMA) is employed. Third and lastly, the bootstrapping method was utilized of Smart-PLS to investigate the significance of relationships between variables.

**2.8. Response Rate**

Respondents were asked demographic questions, including gender, race, education level, income level, position in the firm, experience, and marital status. The researcher successfully collected 38 complete responses, with 100% male members in managerial positions. Out of 38, three respondents had a Master’s level of education, 32 had a bachelor’s, and three were below graduation. Fifteen participants had a higher income level of more than 200,000 PKR per month, 10 had higher than 150,000 PKR per month, and thirteen had below 150,000 PKR per month.

**2.9. Measurement Model Assessment**

Reliability and validity of variables were determined in this section that appeared in the research framework. The Smart-PLS 4.0 was utilized for data analysis, measurement model assessment is the first phase. The reliability of the constructs is determined based on the Cronbach alpha ( $\alpha$ ), composite reliability, and average variance extracted (AVE). According to the suggested criteria, the value for Cronbach alpha ( $\alpha$ ) and composite reliability must be higher than 0.70 for acceptable reliability, values higher than 0.80 are good acceptability, and higher than 0.90 is considered as excellent reliability. The acceptable value of AVE is 0.50 to satisfy the convergent validity (Sarstedt et al., 2014). Table 1 below demonstrates the values for reliability and validity.

**Table 1**

S#	Constructs	Cronbach alpha $\alpha$	CR	AVE
1	SP	0.933	0.938	0.507
2	D_LS	0.881	0.893	0.622
3	D_LR	0.813	0.814	0.644
4	D_INN	0.912	0.919	0.694

Note: SP (Sustainable Performance), D\_LS (Digital Leadership), D\_LR (Digital Learning), D\_INN (Digital Innovation),  $\alpha > 0.70$ , CR  $> 0.70$ , AVE  $> 0.50$

The above table presents the reliability and validity of the constructs. The Cronbach alpha for each construct meets the benchmark of acceptability. Similarly, the CR is acceptable as per the criteria. The AVE was found to be higher than the cutoff point, but one item was deleted from SP due to lower outer loading. Figure 1, presents the measurement assessment model, extracted from Smart-PLS 4.0, that shows the graphical representation of the research framework.

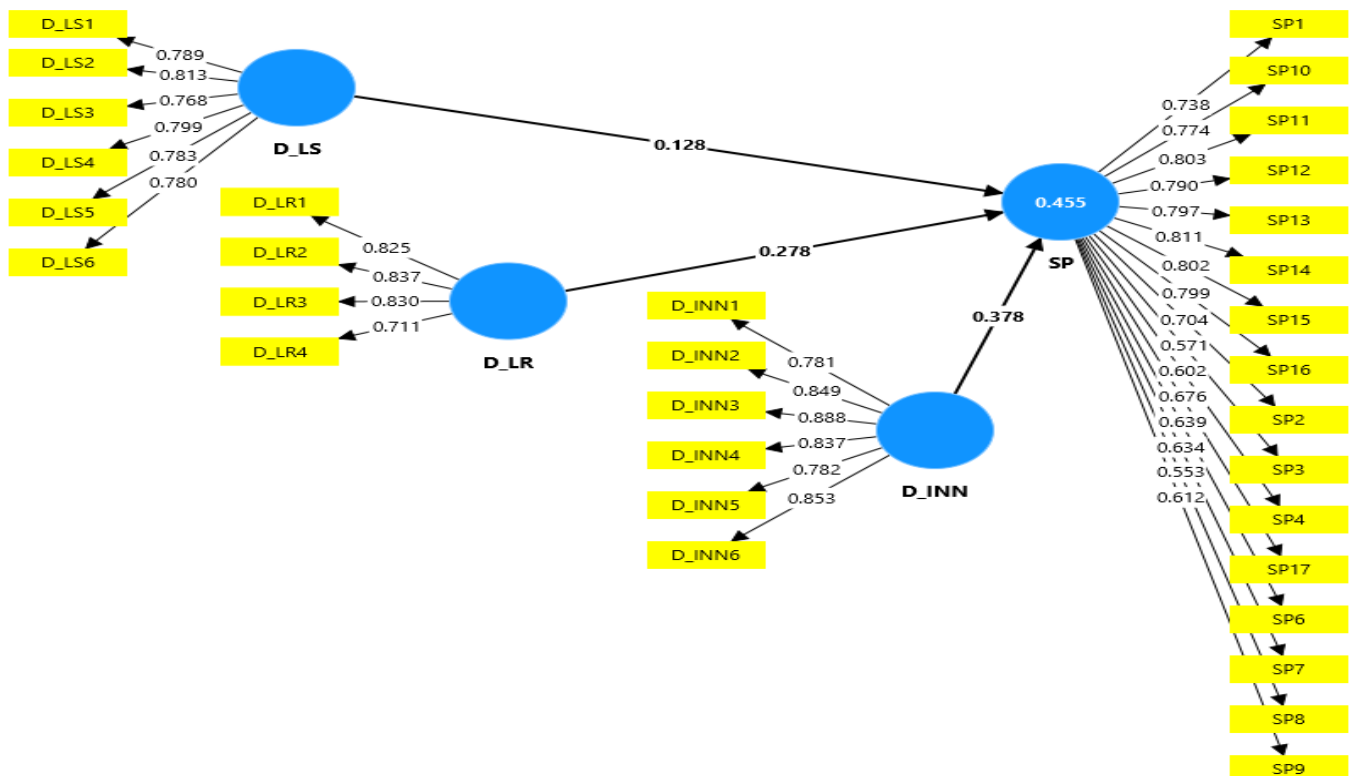


Figure-II Measurement Model

Note: SP (Sustainable Performance), D\_LS (Digital Leadership), D\_LR (Digital Learning), D\_INN (Digital Innovation),  $\alpha > 0.70$ , CR  $> 0.70$ , AVE  $> 0.50$

### 2.10. Discriminant Validity

This section of measurement model assessment demonstrates the discriminant validity of each construct to assess the discrimination among variables. The suggested criteria of discriminant validity are to compare the correlational values of each construct; the square root of AVE presents the values of correlation must be higher than the correlational value of distinct variables (Fornell & Larcker, 1981). The intersect values of each construct must be greater than other correlational values of the same column, as shown in Table 2.

**Table 2**

Constructs	D_INN	D_LR	D_LS	SP
D_INN	<b>0.833</b>			
D_LR	0.535	<b>0.802</b>		
D_LS	0.564	0.713	<b>0.789</b>	
SP	0.599	0.572	0.540	<b>0.712</b>

Note: SP (Sustainable Performance), D\_LS (Digital Leadership), D\_LR (Digital Learning), D\_INN (Digital Innovation). Square Root of AVE intersectional bold diagonal values must be higher than other correlational values of the same column

The values in the above table demonstrate the assessment of discriminant validity; the diagonal values are higher than other correlational values, which satisfy the discriminant validity criteria.

### 2.11. Structural Equation Model (SEM)

This analysis phase entails assessing the relationship between variables as explained in hypothesized statements. The hypothesized relationship is determined for its significance based on the  $\beta$ -value, t-statistics and p-value. The suggested criteria of relationship significance are determined by the t-value, which must be higher than 1.96, and 0.05 is the cutoff point for p-value. (Hair et al., 2012).

**Hypothesis H1:** This relationship between digital leadership and sustainable performance is examined, and it is argued that the leadership approach is crucial in determining performance-related outcomes. Previously, it has been reported that leadership dares to provide direction for the achievement of goals and objectives (Soliman et al., 2020). Prior literature also depicted that the leadership approach tends to influence the employees' behavior (Wulandari et al., 2021). The results of H1 are reported in Table 3 below. The relationship is insignificant based on the  $\beta$ -value, t-value, and p-value that don't meet the criteria of significance. That means digital leadership has no significant relationship or association with sustainable performance. Based on the results in Table 3, it was observed that the t-value was found to be lower than the cutoff point. Therefore, hypothesis H1 is rejected.

**Hypothesis H2:** The H2 investigates the relationship between digital learning and sustainable performance. Based on the literature, this study argues that digital learning impacts sustainable performance. It has been reported previously that digital resources assist in achieving progress and organizational goals (Kaklamanou et al., 2012; Lin et al., 2017). The literature also explained the relationship between digital learning and sustainable performance; the scholars have established that digital learning is an essential element for sustainable performance (Alotaibi, 2022). The results of H2 are presented in Table 3 below. The results depicted that the  $\beta$ -value is 0.232, the t-value is 2.785, and the p-value is 0.005, which shows that the relationship is significant and findings are aligned with previous studies.

**Hypothesis H3:** The 3<sup>rd</sup> hypothesis investigates the relationship between digital innovation and sustainable performance. Innovativeness is one of the striking factors in today's environment that play an essential role in performance-related outcomes. The researcher incorporated that variable of digital innovation to explain the phenomenon of sustainable performance. Digital technologies tend to influence learning, cybersecurity, blockchain, artificial intelligence, cloud computing and big data have an impact on performance-related consequences (Bukht & Heeks, 2017). Another research study has reported that digital platforms predict the performance of firms (Yousaf et al., 2021). The results of this hypothesis are presented in Table 3 below. Based on the results, the t-value was observed to be higher than the cutoff point. Therefore, the relationship is significant and hypothesis H3 is accepted. Figure III below presents the SEM extracted from Smart-PLS.

**Table 3**

S#	Hypotheses	$\beta$	t-statistics	p-value
<b>Direct hypotheses</b>				
H 1	D_LS→SP	0.149	1.884	0.060
H 2	D_LR→SP	0.232	2.785	0.005
H 3	D_INN→SP	0.386	5.777	0.000
<b>Moderating Effect</b>				
H 4	D_LS*D_INN→SP	0.124	1.524	0.128
H 5	D_LR*D_INN→SP	0.191	2.212	0.027

Note: SP (Sustainable Performance), D\_LS (Digital Leadership), D\_LR (Digital Learning), D\_INN (Digital Innovation). T-value>1.96\*\*\*, p-value<0.05

Below is the SEM model presented taken from Smart-PLS 4.0

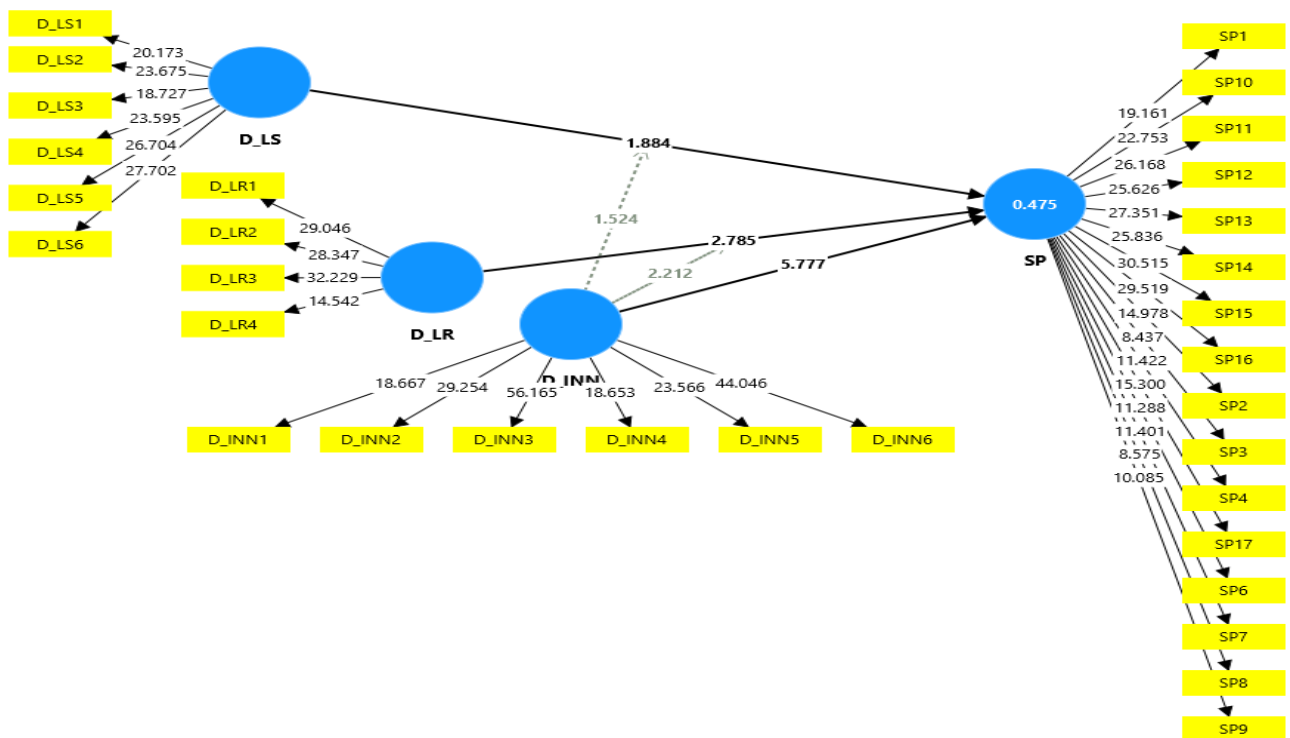


Figure-III Structural Equation Model

Note: SP (Sustainable Performance), D\_LS (Digital Leadership), D\_LR (Digital Learning), D\_INN (Digital Innovation), T-value > 1.96\*\*\*, p-value < 0.05

### 2.12. Moderation Effect

This study examined the moderation role of digital innovation between digital leadership and sustainable performance and between digital learning and sustainable performance. The notion of the study is that digital innovation is a specific capability that enables firms to sustain their performance. The moderation role of digital innovation is to strengthen the relationship between exogenous and endogenous constructs of the framework.

**Hypothesis H4:** Hypothesis H4 investigates the moderation effect of digital innovation between digital leadership and sustainable performance. The researcher argues that digital innovation moderates the relationship between digital leadership and sustainable performance, as the leadership approach has been reported as a major striker for performance. The results of the moderation effect are shown in Table 3 above; the t-value was found to be lower than the cutoff point, which means the relationship is insignificant. Hence, the hypothesis H4 is rejected on a statistical basis.

**Hypothesis H5:** This hypothesis H5 also investigates the moderation effect of the relationship between digital learning and sustainable performance. Similar to the previous hypothesis, it examined the moderation between digital learning and sustainable performance. Based on the results in Table 3 the moderation effect is significant. The value for t-statistics is observed to be higher than 1.96 and reported as 2.212, which satisfies the requirement of significance. Therefore, the hypothesis H5 is accepted.

Hypothesis H4 does not evidently show the moderation effect of digital innovation, which means that digital leadership alone is not sufficient to determine sustainable performance. Similarly, hypothesis H1 is insignificant that digital leadership is insignificant to sustainable performance.

### 3. Conclusion

The current era demands the implementation of digital platforms to perform routine activities. Recently, it has been observed that our society is surrounded by digitalized applications that reduce efforts and costs; and increase productivity, accuracy and efficiency. This research effort has been made to determine the sustainable performance of the SME sector in Punjab. The results of the study reported that digital leadership is not a striking factor that increases the adoption of digitalization. The findings revealed that digital learning is significant to sustainable performance, which means digital platforms, the adoption of diverse digital applications and operational initiatives are required for achieving sustainable performance. It has been reported that digital innovation should be the prime concern of firms for achieving sustainability.

Moreover, the moderation role of digital innovation was examined between exogenous and endogenous constructs. The SME sector of Pakistan is facing challenges, issues and problems in adopting a digitally equipped working environment due to a lack of leadership approach, potential drawbacks in ineffective learning, and compromised digital innovation capabilities. The findings of the current study reported that leadership of the SME sector lacks in appropriate leadership approach. Therefore, there is an insignificant relationship between digital

leadership and sustainable performance. Digital learning has the potential to predict sustainable performance. Therefore, hypothesis H2 is accepted. Similarly, hypothesis H3 is accepted on statistical grounds that digital innovation predicts sustainable performance. Hypothesis H4 is rejected due to the insignificant moderation role of digital innovation in the relationship between digital leadership and sustainable performance. However, hypothesis H5 is accepted that there is a significant relationship between digital learning and sustainable performance.

The SME sector must undergo major changes in adopting large-scale IT-based equipment for operational activities to ensure sustainability perspectives. There is a dire need to shape the leadership approach of the higher management tier to take initiatives that lead to sustainable performance. Digital learning is a crucial factor in adopting digital transformation and sustainable performance. This study suggested establishing the knowledge management platform, initiating various training and development programs, and enriching the skills that contribute to attaining sustainable performance. Further, digital innovation provides the grounds for implementing digital platforms to transform existing practices and foster organizational objectives.

There were various limitations of the present study faced by the researcher. The researcher has to face a shortage of time and resources to complete the study. The data was collected from the middle management of firms. However, in the future, the researcher should focus on data collection from diverse SME sectors and all hierarchies of firms, including end-users, to compare and better understand the phenomenon. Future research studies should be conducted on assessing the various other variables related to workplace behaviors to explain the phenomenon of sustainable performance.

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