PROSCHOLAR INSIGHTS

Research Article   **Open Access Journal**

A Quantitative Study of Gendered Interactions and Spatial Perceptions in Online Higher Education in Pakistan

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Abstract: This research paper has been articulated to access gender spaces in virtual learning environments in higher education in Pakistan. It has been observed that social constructionists, feminists, and gender-related researchers around the world all agree that gender is a social and cultural construct. There are only two characteristics femininity and masculinity. A quantitative study has been conducted and a sample of 316 students enrolled in the BS (4 Years) social sciences program in a public sector university has been selected. A cross-sectional study has been conducted, and a structured questionnaire has been used consisting of different sections including socio-demographic, gender spaces, and virtual learning environment. Pilot testing has been done on 30 random students and an attitudinal scale of (dis)agreement has been used. Structural Equation Modeling (SEM) technique has been applied to measure the effects of the model. The study asserts that negotiation and contrast, gender-sensitive language, mobility restriction, and gender-inclusive have positive effects on the virtual learning environment in higher education among students. However, overall study analysis reveals that generally, absolutely, and gender-neutral spaces has also positive effects on virtual learning environments. Moreover, the audio/video material has been found to positively affect the virtual learning environment among students at the tertiary level.

Keywords: Gender Spaces, Online Learning, Higher Education, Gender, Students

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Introduction

It has been observed that social constructionists, feminists, and gender-related researchers around the world all agree that gender is socially constructed (Shoaib, 2024). There are only two characteristics femininity and masculinity (Shoaib & Ullah, 2021b; Auster & Ohm, 2000). It indicates that gender is not a natural or learned behavior rather it is a product of society (Francis, 2006). However, gender spaces are the places, whether physical or virtual, where social interactions, behaviors, and experiences are heavily influenced by gender identity and expression (Shoaib & Ullah, 2019; McDowell & Sharp, 2016). These spaces include restrooms, locker rooms, offices, classrooms, online forums, and other places where gender-related power dynamics, social norms, and expectations are visible and have the potential to impact people's opportunities and experiences (Shoaib & Ullah, 2021a; Spain, 2014). Masculine society tends to promote and respect traditional male traits and roles above those of women. It takes many different forms like gender roles, workplace dynamics, cultural norms, social structure, expectations, and pressure in all forms of masculine society (Itula-Abumere, 2013). Females have less participation rather than males in all aspects of life (Shoaib & Zaman, 2025). In masculine society, females have fewer spaces, however, gradually females get spaces but not proper yet or in every field of society. The masculine societies emphasized male traits more rather than female (Shoaib, 2021; Stets & Burke, 2000). Hence, this research paper has been articulated to access gender spaces in virtual learning environments in higher education.

Review of Literature

The argument of the study asserted that the union of gender, social background, and university spaces highlights the complex interplay of inequalities within the higher education system (Shoaib, 2023a; Villa Lever, 2020). However, the study findings outlined exploring the relationship between virtual learning environment and learning outcomes (Shoaib, 2023b), use, and preferences among students at the tertiary level (Lin et al., 2011). Nonetheless, the study of Shin et al. (2013) asserted that explored the experience of the user of the three-dimensional virtual learning environment. Moreover, the study findings showed that the real world brings into the building reflection on the online learning environment (Shoaib et al., 2025). Contently, the study findings concluded that gender differences and emotions in higher educational institutions among students (Shoaib, 2024a; Burke, 2017). Besides, the study of Lacka and Wong (2021) indicated that analyzing the influence of digital technologies on the academic achievements of students in higher education.

The study findings examined investigating students' encounters with leisure education through an inter-university virtual learning environment at the tertiary level (Shoaib et al., 2025b). However, the study of Savin-Baden (2008) revealed that transitioning from cognitive capacity to societal transformation evolving perspectives on education with an immersive virtual learning environment at the tertiary level among students. Contently, the argument of the study asserted that assessing the impact of audio feedback by virtual learning environment on summative assessment and evaluation at higher education level (Shoaib, 2024a; Carruthers et al., 2015). In a nutshell, the study findings outlined that evaluating the student's learning journey and enhancing degree inclusivity through immersive and interactive three-dimensional virtual settings (Shoaib et al., 2021; Shoaib et al., 2024; Guillaume et al., 2023). Further, the study by Kjaran (2019) asserted that gender-segregated areas within higher educational institutions had been found among students. The study findings showed that enhancing the estimation of time-on-task calculation within a digital learning environment and interactive learning forums had been found at higher educational levels (Shoaib, 2024c; Halvoník et al., 2023). Nonetheless, the study findings concluded that overcoming intersectional obstacles to women's progression in higher educational institutions recognized for their gender equality initiatives (Shoaib, Tariq, & Iqbal, 2025a). Besides, the study of Jena (2016) indicated that to explore the connections between attitudes, learning readiness, and learning styles had been found during virtual classes. The research aimed to understand how these factors interrelate and impact students' experiences in virtual learning settings and a study was conducted among Indian students. Contently, the study findings examined that exploring the scheme that engaging students as partners could be an effective approach to improving gender equity by fostering agency and leadership for women (Shoaib et al., 2025; Acai et al., 2022). Moreover, the study of Willis (2014) revealed that it explored the complicated dynamics of gender, power, and spatial negotiation in the context of masquerade performances in Nigeria.

The study findings outlined that tackling the repressive character of gendered places by reflecting from viewpoints that go beyond the boundaries of gender double thinking had been found at higher levels (Shoaib et al. 2025; Doan, 2010). In a nutshell, the argument of the study revealed that the complex web of educational inequality is highlighted by the convergence of gaps at the intersections of gender, and social origins found in university environments (Shoaib et al., 2025; Villa Lever, 2020). Further, the study of Goulão (2013) asserted that gender factors affected virtual learning styles publications in social and behavioral sciences had been found in remote learning. Nonetheless, the study findings showed that gender discourse and societal standards had been significantly impacted by the several feminisms that had emerged throughout history each with their own distinct goals and traits (Shoaib, 2025a; Malinowska, 2020). However, the study findings examined that for their studies in higher education, why do students choose specific learning environments with diary research, this question is investigated and also found gender spaces (Shoaib, 2025b; Beckers et al., 2016).

The study of Delph-Janiurek (2000) indicated that gender, power, and communication in England and higher education walking the talk and talking the walk had been found in gender spaces in virtual education. Contently, the study findings concluded that exploring the utilization of virtual reality for learning, collaboration, and behavioral outcomes, encompasses content, systems, strategies, and contextual designs (Shoaib, 2024e; Lytras et al., 2016). In a nutshell, the study of Henderson and Burford (2020) revealed that examining conferences from a gendered perspective views them as places for community development, learning, and knowledge generation. Nonetheless, the study findings outlined that exploring Indigenous masculinities within higher education delving into the intersections

of indigeneity, race, and gender through the concept of gender spaces found during online classes (Shoaib, 2024d; Fa'avae et al., 2022). However, the argument of the study revealed that an empirical study in China examining learning patterns and learning environments had been found among students at the tertiary level (Shoaib, 2024b; Yu et al., 2021).

The study of Whitchurch (2010) asserted that exploring the impact of public and private spatial dynamics on professional identities within the realm of higher education. Further, the study findings showed that investigating the evolving learning environments an examination of gender dynamics and norms in online learning had been found during the Covid-19 pandemic at the University of Johannesburg (Shoaib, 2024b; Gwedla, 2022). Moreover, the study findings examined that what are the important human capacities to consider when creating a policy on gender equality had been found in higher education (Shoaib, 2024b; Loots & Walker, 2015). Contently, the study by Haley (2018) indicated that in returning to one's rural roots after completing higher education the gendered aspect of social space had been found in gender spaces in virtual learning environments at the tertiary level. In a nutshell, the study findings concluded that reimagining pedagogies in higher education to explore gender, emotion, and diversity had been found during digital classes (Shoaib et al., 2021; Shoaib et al., 2021; Burke, 2015).

Theoretical Framework

The gendered space theory was developed by social theorists and feminist scholars (Beebe et al., 2017). Gendered space theory studies how people utilize, perceive, and analyze their physical and social environments through gendered societal constructions. It looks into how gender identities, power relationships, and social norms impact, how spaces are set up, experienced, and accessed. This theory originated from interdisciplinary fields such as geography, sociology, and feminist studies, and it emphasized the connections between gender and other social categories such as race, class, and sexual orientation (Peng, 2024). The spatial division of gender looks at how social and physical environments influence gender roles and identities. Consider the disparities in gender expectations and standards between public and private places. The study examined how environments such as public spaces, residences, and workplaces either supported or contradicted gender norms. The concept of intersectionality, which examines how gender is affected by various social groups like race, class, sexual orientation, and skills, is frequently integrated into this theory. Studying how different people interpret space differently is made easier with the support of this intersectional method. The idea of gender identity and appearance examined how individuals utilized and got access to multiple places. Concerns about safety or harassment, for example, caused hurdles or concerns for women when they entered certain public spaces. Social construction of spaces examined how these systems both reflected and reinforced gender norms. It involved looking at the ways that gender dynamics affected architecture, urban planning, and even virtual environments like online communities. Cultural norms, attitudes, and practices socially build gender places (Bailey, 2020). Hence, the following conceptual framework has been developed on gender spaces in virtual learning environments in higher education.

Figure 1
Conceptual Framework of the Model
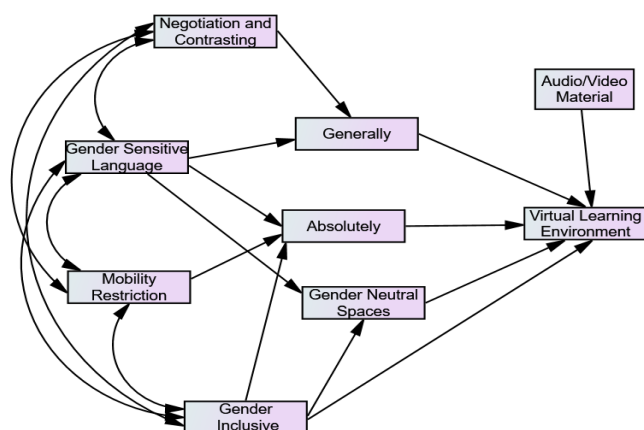
The Data and Methods

A quantitative study has been conducted and a sample of 316 students enrolled in the BS (4 Years) social sciences program in a public sector university has been selected. A cross-sectional study has been conducted and a structured questionnaire has been used consisting of different sections including socio-demographic, gender spaces, and virtual learning environment. Pilot testing has been done on 30 random students and an attitudinal scale of (dis)agreement has been used. Structural Equation Modeling (SEM) technique has been applied to measure the effects of the model. In the model, there are four independent variables (including negotiation and contrasting, gender-sensitive language, mobility restriction, and gender-inclusive), three path variables (including generally, absolutely, and gender-neutral spaces), 0ne intervening variable (audio/video material), and one dependent variable (including virtual learning environment). The scale has been pre-tested and the results are as follows;

Table 1
Reliability Test

Variable	Code	Items	Alpha value
Mobility Restriction	MORE	7	.729
Gender Sensitive Language	GESL	7	.715
Negotiation and Contrasting	NEAC	7	.734
Gender Inclusive	GEIN	7	.709
Generally	GENE	7	.713
Absolutely	ABSO	7	.703
Gender Neutral Spaces	GENS	7	.723
Audio/Video Material	AUVM	7	.718
Virtual Learning Environment	VILE	7	.863
Overall		63	.972

Results and Discussion

The primary data showed that 33.5 percent of students are from up to 19 age group. Similarly, 37.4 percent of students are from the 20-21 age group. 22.5 percent of students are from the 22-23 age group. However, 5.1 percent of students are from the 24-25 age group. The 1.5 percent of students are from the 26 and above age group. Correspondingly, the data analysis showed that the gender of 19.3 percent of students were male and the remaining 80.7 percent of students were female. Nevertheless, the data analysis pointed out that the family occupation of the students is labor with the highest percentage of 28.2. Likewise, the government job holders with a medium percentage of 18.3, and the last one with the lowest percentage of 11.4 is private.

Table 2
Direct Effects of the Model

Variables			Standardized Regression Weights	Estimate	S.E.	C.R.	P
GESL	--->	ABSO	.128	.107	.044	2.423	.015
GESL	--->	GENS	.141	.126	.047	2.699	.007
GESL	--->	GENE	.200	.179	.053	3.403	***
NEAC	--->	GENE	.100	.095	.056	1.705	.088
GEIN	--->	GENS	.360	.361	.052	6.890	***
GEIN	--->	ABSO	.339	.319	.048	6.608	***
MORE	--->	ABSO	.175	.153	.046	3.342	***
AUVM	--->	VILE	.563	1.729	.115	15.014	***
GENS	--->	VILE	.241	.859	.145	5.913	***
GENE	--->	VILE	.320	1.135	.133	8.505	***
ABSO	--->	VILE	.135	.513	.155	3.312	***
GEIN	--->	VILE	.085	.304	.155	1.953	.051

Variables			Standardized Regression Weights	Estimate	S.E.	C.R.	P
Covariances							
NEAC	<-->	MORE		5.882	.895	6.575	***
GESL	<-->	GEIN		2.706	.836	3.237	.001
MORE	<-->	GESL		4.162	.913	4.558	***
NEAC	<-->	GESL		5.766	.930	6.201	***
NEAC	<-->	GEIN		2.561	.787	3.253	.001
MORE	<-->	GEIN		1.859	.791	2.351	.019
Variances							
NEAC				14.562	1.160	12.550	***
MORE				14.937	1.190	12.550	***
GESL				16.422	1.309	12.550	***
GEIN				12.955	1.032	12.550	***
e1				12.323	.982	12.550	***
e3				10.814	.862	12.550	***
e2				9.098	.725	12.550	***
AUVM				17.579	1.401	12.550	***
e4				73.458	5.853	12.550	***

Model Fit Summary: IFI=.947, CFI=.983, NFI=.905, AGFI=.903, RMSEA=.068, Chi-square = 172.269, df= 18, Probability level = .000

Hypothesis 1: *Gender-sensitive language, gender inclusive, and mobility restrictions had direct effects on absolutely.*

The results supported hypothesis 1 that there are direct positive effects of gender-sensitive language (β = .128), gender-inclusive (β = .339), and mobility restriction (β = .175) on absolutely. The argument of the study asserted that the role of internet connectivity and social media intensity in political behavior had been found in virtual learning settings among university students (Ahmad, 2020). However, the study findings outlined that the teacher's perception and skills about the use of virtual education settings to improve digital learning were gender inclusivity in virtual learning education (Badilla Quintana et al., 2016). Nonetheless, the argument based on the study findings revealed that availability and connection in transportation moving beyond physical to online platforms had been found in online settings at the tertiary level (Beecroft, Cottrill, Farrington, Nelson, & Niewiadomski, 2019). Contently, the study findings concluded and linked with the assumption that in online libraries and instruction sessions, the perception of learners and teachers had been found in web-based platforms (Bennett, 2022). The empirical evidence based on the study findings highlighted that the teaching use of virtual world tools is more difficult for physical education the engineering teachers' perception of digital platforms and also found gender-sensitive language issues at the tertiary level (Callaghan et al., 2009).

Hypothesis 2: *Gender-sensitive language and gender-inclusive had direct effects on gender-neutral spaces.*

The results supported hypothesis 2 that there are direct favorable effects of gender-sensitive language (β = .141), and gender-inclusive (β = .360) on gender-neutral spaces. The argument of the study asserted that the use of web-based tools for instruction had been found in virtual learning environments at the tertiary level (Carey, 1999). However, the study findings outlined that the research on virtual education platforms encompassing diversity in international education had found gender-neutral spaces at higher levels (Cho et al., 2024). Nonetheless, the argument based on the study findings revealed that examining the possibilities that await electronic stations for working together to solve socio-ecological problems of growth had been found in gender spaces in the virtual era (Cieslik et al., 2018). Contently, the study findings concluded and linked with the assumptions that another emerging aspect of linkage and commercial holds an innovative spirit had found gender inclusivity in both genders students at the tertiary level (Deshmukh & Song, 2025). The empirical evidence based on the study findings highlighted that individual agency contribution to limit actions and continuous connectedness had been found in digital aspects of sources for web-based education at higher levels (Farivar et al., 2024).

Hypothesis 3: *Gender-sensitive language and negotiation and contrasting had direct effects on general.*

The results supported hypothesis 3 that there are direct favorable positive effects of gender-sensitive language (β = .200), negotiation, and contrasting (β = .100) in general. The argument of the study asserted that the examination of the implementation of instruction in procedures between a computer simulation to a physical actual setting had been found to negotiate and contrast in virtual learning environments at the tertiary level (Ganier et al., 2014). However, the study findings outlined that in the search for wireless internet and young people in cities unemployment and smartphone connectivity had been found generally in the online world among students (Akhter, 2015). Nonetheless, the argument based on the study findings revealed that the measure of information objectives in virtual communities reported system connectivity and privacy found in web-based learning at a higher level (Kang et al.2018). Contently, the study findings concluded and linked with the assumption that using real-time video meetings to watch educational field activities begin to go online and had been found gender spaces in remote classes at higher education (Krause, Douglas, Lynch, & Kesselring, 2018). The empirical evidence based on the study findings highlighted that during the period of virtual learning negative connectivity issues arose and also had been found bad online assessment methods at higher levels (Leppäkumpu & Sivunen, 2024).

Hypothesis 4: *Audio/video material and gender-neutral spaces had direct effects on the virtual learning environment.*

The results supported hypothesis 4 that there are direct significant effects of audio/video material (β = .563) and gender-neutral spaces (β = .241) on the virtual learning environment. The argument of the study asserted that a field is an ontological framework and perception in a virtual learning environment receiving actual and had been found in private/public spaces at the tertiary level (Lundin, 1998). However, the study findings outlined that the internet connectivity maintained during online learning settings after facing the bad circumstances of education and also had been found internet connectivity issues at the tertiary level (Mao et al., 2013). Nonetheless, the argument based on the study findings revealed that digital learning affected due to gender and gender spaces exist in web education and also had been found gender spaces in virtual learning environments at the tertiary level (Moyo, 2004). Contently, the study findings concluded and linked with the assumption that using the internet for browsing the gender spaces at the tertiary level among both genders students also had found mobility restrictions during online classes (Ozyegin, 2012). The empirical evidence based on the study findings highlighted that the issue of lost connectivity during the digital classes affected students' education and also had been found gender-sensitive pronouns at the tertiary level (Ranga, Dave, & Verma, 2016).

Hypothesis 5: *Generally, absolutely, and gender-inclusive had direct effects on the virtual learning environment.*

The results supported hypothesis 5 that there are direct positive effects of generally (β = .320), absolutely (β = .135), and gender-inclusive (β = .085) on virtual learning environments. The argument of the study asserted that the constant communication social networking and behavioral regulation of Generation Z through cell phones with the web had been found in gender dynamics during online learning environments (Rice & Hagen, 2010). However, the study findings outlined that the perception and attitudes of students towards online education and physical education at university departments had been found gender neutral spaces at higher levels of education (Shoair et al., 2023). Nonetheless, the argument based on the study findings revealed that gender spaces exist in virtual learning environments at the tertiary level and also had been found to negotiate and contrast during digital classes (White et al., 2008). Contently, the study findings concluded and linked with the assumption that in the classroom the teacher's and administrators' perceptions of gender had been found gender inclusivity during virtual learning environment at the tertiary level (Morrissette et al., 2018). The empirical evidence based on the study findings highlighted that the teaching legal investigation with the concept of diversity, fairness, and participation and the perspectives for electronic and face-to-face classroom leadership had been found in digital learning and the use of digital aspects of sources (Nejdl & Dalton, 2022).
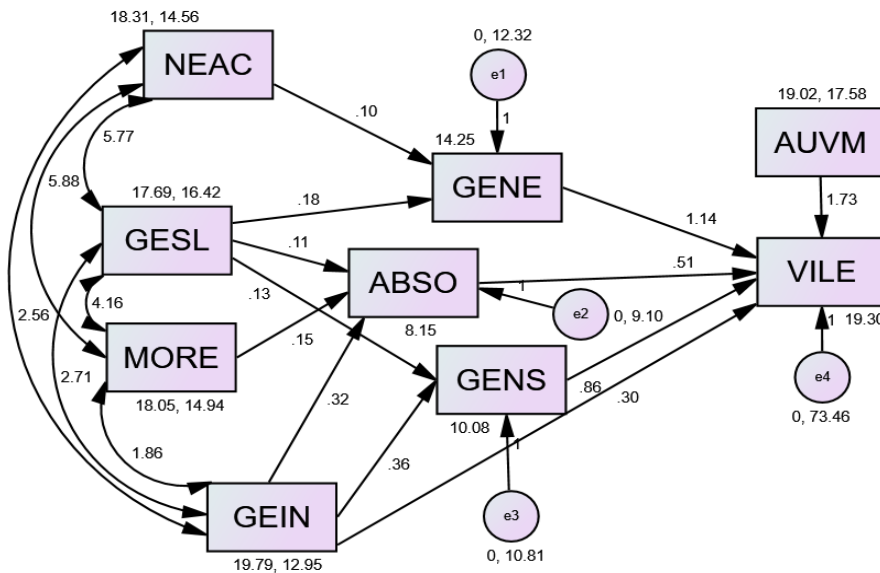
Figure 2

Model Fit Diagram

Table 3

Indirect Effects of the Model

Indirect Path	Unstandardized Estimate	Lower	Upper	P-Value	Standardized Estimate
GEIN --> GENS --> VILE	0.310	0.189	0.470	0.001	0.087***
GEIN --> ABSO --> VILE	0.164	0.068	0.292	0.010	0.046*
NEAC --> GENE --> VILE	0.108	0.002	0.232	0.097	0.032†
MORE --> ABSO --> VILE	0.079	0.025	0.174	0.010	0.024*
GESL --> GENE --> VILE	0.203	0.093	0.344	0.002	0.064**
GESL --> GENS --> VILE	0.108	0.042	0.193	0.006	0.034**
GESL --> ABSO --> VILE	0.055	0.012	0.134	0.027	0.017*
Significance of Estimates: *** p < 0.001,** p < 0.010, * p < 0.050,† p < 0.100					

Hypothesis 6: *Gender-inclusive and gender-sensitive language had an indirect effect on the virtual learning environment through the mediation of gender-neutral spaces.*

The results presented in Table 3 supported hypothesis 6 that there is a significant indirect effect of gender-inclusive (β = 0.310), and gender-sensitive language (β = 0.108) on the virtual learning environment through the mediation of gender-neutral spaces. The argument of the study asserted that according to the instructor investigation methods comparison between the effectiveness of virtual learning and classroom had been found gender neutral spaces during online assessment methods (Ni, 2013). However, the study findings outlined that in online social work courses, the reflection of teaching methods related to different gender students had been found gender-inclusive learning at the tertiary level (Richter, 2019). Nonetheless, the argument based on the study findings revealed that learner outcomes for web-based higher learning as impacted by an identity concept had been found gender sensitive worlds during web-based learning at higher levels (Bull et al., 2024). Contently, the study findings concluded and linked with the assumption that examining the impact of instructional methods on learners to determine that these were important and also had been found gender spaces in virtual learning environments at the tertiary level (Ding et al., 2023). The empirical evidence based on the study findings highlighted that academic women-biased connections are how gender, as well as age, affected the teacher and student interaction had been found in gender spaces at the tertiary level during remote learning (Einarsson & Granström, 2002).

Hypothesis 7: *Gender inclusive, mobility restriction, and gender sensitive language had an indirect effect on virtual learning environment through the mediation of absolutely.*

The results presented in Table 3 supported hypothesis 7 that there is a significant indirect effect of gender-inclusive (β = 0.164), mobility restriction (β = 0.079), and gender-sensitive language (β = 0.055) on the virtual learning environment through the mediation of absolutely. The argument of the study asserted that connecting cooperative education with virtual learning environments to promote joint governance digitally had found gender inclusivity in virtual education (Emerson & Gerlak, 2016). However, the study findings outlined that the classroom to digital learning move from offline public spaces it's a social media concept and had found mobility restrictions in virtual education (Flores et al., 2020). Nonetheless, the argument based on the study findings revealed that from the perspective of learners what makes up their presence within a remote classroom had been found in gender spaces at the tertiary level among both gender students (Hajibayova, 2017). Contently, the study findings concluded and linked with the assumption that students create a transitional space between being regulated and applying freedom in the confusing virtual learning environment and also found gender dynamics during online classes (Kwon & Lee, 2024). The empirical evidence based on the study findings highlighted that safe areas on the internet are beneficial for female students to get an education without any harassment and also had been found in gender-neutral spaces in digital learning settings (Lucero, 2017).

Hypothesis 8: *Negotiation and contrasting, and gender sensitive language had an indirect effect on virtual learning environment through the mediation of generally.*

The results presented in Table 3 supported hypothesis 8 that there is a significant indirect effect of negotiation and contrasting (β = 0.108), and gender-sensitive language (β = 0.203) on the virtual learning environment through the mediation of generally. The argument of the study asserted that from the international point of view, virtual learning is better rather than physical learning also had been found gender inclusivity at the tertiary level (McIsaac, 2002). However, the study findings outlined that overcoming a deadlock between gender and progress in academic settings had been found gender neutral spaces at universities (Rivas & Purewal, 2024). Nonetheless, the argument based on the study findings revealed that expanding knowledge of digital discourse on an extension of virtual learners' assistance assumptions and gender views had been found in gender-inclusive education (Spence et al., 2023). Contently, the study findings concluded and linked with the assumption that in the remote learning classroom investigating the misbehaviors and rudeness of teachers had found communication gap between instructor and learner at the tertiary level (Vallade & Kaufmann, 2018). The empirical evidence based on the study findings highlighted that managing a difficult environment it's the perspective of female racial teachers and also found gender spaces in online education at the tertiary level (Yao & Boss, 2020).

Conclusion

The conclusion of this study was based on the primary data collected from the students enrolled in the Faculty of Social Sciences at the public sector university. Similarly, the study concluded that negotiation and contrast, gender-sensitive language, mobility restriction, and gender-inclusive had positive effects on the virtual learning environment in higher education. However, the overall study concluded that generally, absolutely, and gender-neutral spaces had also positive effects on the virtual learning environment. Moreover, the audio/video material has been positively affecting the virtual learning environment. It indicates that gender is not a natural or learned behavior rather it is a product of society. However, gender spaces are the places, whether physical or virtual, where social interactions, behaviors, and experiences are heavily influenced by gender identity and expression. Hence, the study findings concluded that gender spaces have been linked with the virtual learning environment of the students in higher education in Pakistan.

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