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ETHICAL ISSUES IN VIRTUAL MEETINGS THROUGH ZOOM CLOUD: A QUANTITATIVE STUDY THROUGH THE OPINION OF UNIVERSITY TEACHERS

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Abstract: The spread of COVID-19 resulted in the deactivation of formal classes and distance education and learning have been adopted in all forms of education. Institutions start using virtual classrooms which cause significant changes in teaching style as well as in teaching pedagogy. Therefore, different cloud hosting platforms are used for conducting lectures among them Zoom Meet is perceived as the leader which has been used across the globe by all forms of education providers. Although studies revealed that there are several privacy and security issues associated with Zoom meet which may affect the intention to use it for business and education purposes. Therefore, a study is required to understand the perception of teachers who are using this application more extensively as compared to other professionals. The data has been collected through quota sampling through closed-ended questionnaires and SMART-PLS has been incorporated for the analysis of data. The results indicated that university teachers are aware of the privacy and security issues associated with the use of Zoom Meet and hence are willing to change the mode of teaching for upcoming stages and semesters.

Keywords: distance learning, zoom meet, COVID-19, data privacy and security & university teachers

Introduction

COVID-19 as a global pandemic resulted in enormous changes in everyone's life. On the other side, governments were also forced to order the transition of work activities through the incorporation of online platforms to protect their citizens from life-threatening diseases. A similar has been observed in the field of academia where institutions were forced to adopt distance-based education through the incorporation of virtual classrooms & video conferencing programs (Cubukcu & Akturk, 2020). However, the incorporation of online learning practices also brings convenience and flexibility to students as well as faculty (Wan Hassan, Ariffin, Ahmad, Hamzah, Rubani & Zakaria, 2020). Hence, the use of tools like Zoom, Google Classroom, Edmodo, etc has been observed on a mass scale to achieve the gist of online learning during the pandemic. However, tools that are used widely and

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commonly lack in extensive functions like the use of (LMS) learning management system (Cubukcu & Akturk, 2020).

However, the use of these online platforms is also subjected to some ethical consideration that was overlooked especially during the times of COVID-19. Due to the pandemic organization was required to develop business models that may increase predominantly in online activities through overcoming security and operational risks. Although the survey conducted in 2020 to understand the trend of adoption for meet applications highlighted that most of the organizations faced severe challenges related to data privacy and data security. In fact, 70% of the respondent indicated threats related to data security challenges. Similar was indicated by organizations operating all over the globe as 49% of the companies were threatened by data privacy and security concerns. Zoom meet was the widely used platform, especially for online learning activities (Yallop & Asghar, 2020) that was seeming to provide the easiest way to individuals for online learning and meetings. Zoom was also perceived as a tool that saves, time, and costs as well as environmental degradations that produce significantly overwhelming (Wan Hassan et al., 2020). On the other side, zoom meet was found under significant criticism due to its security vulnerabilities and involvement in falsified advertisement campaigns (Yallop & Asghar, 2020).

In fact, Zoom was also criticized for selling customer-related data to third parties, and hence the organization has been criticized severely for unethical conduct against business norms and ethical conduit (Yallop & Asghar, 2020). Hence, the education community is forced to observe other open-source platforms that are not only free to use but also have a better capacity to run online classes due to free LMS services e.g., Moodle, Sakai, etc. In fact, schools, colleges, and universities also considered having their own build LMS system in order to deal effectively with the academic and research requirements (Cubukcu & Akturk, 2020). Therefore, there is a legitimate need to consider and evaluate the challenges and threats that have created issues related to information secrecy and privacy (Secara, 2020).

Statement of Problem

Online education is always supplemented with technological challenges and pedagogical insecurity (Langford & Damsa, 2020). However, to increase the value of the process video conferencing is used as a tool, especially in the case of higher education (Upshaw, 2019). Zoom Meet has the most preference in this regard (Langford & Damsa, 2020) although very few studies e.g., Archibald et al (2019); Cubukcu & Akturk (2020) and Wan Hassan et al., (2020) etc are conducted to reflect uses, significance, and threats of Zoom. Thus, there is a need to understand more about the technological threats associated with the use of online teaching platforms (Langford & Damsa, 2020). In fact, more is to be learned and explored about all the available online learning tools (Upshaw, 2019). Hence conduction of a study to understand the threat possess by Zoom Meet is legitimate as the use of applications is also supplemented with threats to information security & privacy along with meeting confidentiality (Secara, 2020).

Theoretical Framework

In recent times various online teaching applications like Zoom, Google Classroom, Edmodo, etc are used for online education. Although these practices became more extensive due to the spread of

COVID-19. Zoom is termed as the market leader due to its ease of use and preference all over the globe (Cubukçu, & Aktürk, 2020).

However, the Effectiveness of online education relied heavily upon online teaching & online learning. Thus, fosters research work, generation of theories, incorporation of ethics & appraisal of benchmark concentrations. These parameters are required for the optimization of quality online course design, teaching, and learning (Adedoyin & Soykan, 2020) & the free online teaching applications were not supplemented with extensive functions like LMS. Although schools during the pandemic need to have a quick and cost-effective replacement of LMS and therefore Zoom meet became the most preferred solution of these times. However, threats of security & privacy became a major area of concern especially when the school was using free online software for education like Zoom. In fact, Zoom was also under criticism for zoom bombing (lack of privacy), data leakage & lacking of security (Cubukçu, & Aktürk, 2020).

Hence on the bases of these variables, a comprehensive research model has been developed to link the use of zoom during COVID-19 with the threats faced by the teaching faculty and their intention to switch. The dependent variable (i.e., intention to switch) is consistent with Adedoyin and Soykan, (2020), i.e., online teaching needs to be ethical & consistent with an appraisal of benchmark concentrations. On the other side, several studies like Long and Khoi (2020) proposed the theory of reasoned action as the prime theory to be used in the studies that are conducted to understand reasons for customer inclination towards technology. Similarly, Yingkondgee et al (2021) also use the theory in order to develop a link between the use of Zoom Meet and other online applications during the pandemic. Hence TRA is suited best to explain who people choose or does not choose any particular product or service as explained by Bagozzi et al (2000) and Wori (2022)

Significance

The study is unique as previously very few studies e.g., Cubukçu and Aktürk (2020) and Wan Hassan et al., (2020) highlighted threats that may hamper working through Zoom. Although none of the studies relate these threats with the intention to quit zoom as the preferred tool for online teaching and learning. Similarly, none of the prior studies conducted the analysis with the reference to Asian or developing sides for illuminating the perceived issues that cause zoom users to switch. Hence the study is pervasive that may act as the base for the conduction of similar studies with reference to zoom and other online meet applications that may hurt the emotions of users.

Literature Review

The outbreak of COVID-19 does not give any leverage to any of the educational institutions and therefore institutions were forced to use free online applications for imparting education. Thus, during a pandemic, the major challenges were data privacy and data security (Cubukçu & Aktürk, 2020). On the other side study by Wan Hassan et al (2020), reflected that the zoom meet application has a massive tendency to fulfill the needs of online education. The application provides ease of education through two-way broadcast lectures and also causes a less negative impact on the environment, in addition, to being cheaper in financial and time-related constraints (Cubukçu & Aktürk, 2020).

Although the privacy policy of the zoom meet Application was not clear about matters of privacy and security and therefore threats regarding data privacy and security cannot be neglected (Cubukçu & Aktürk, 2020). Similar sort of issues was elaborated on by Cubukçu and Aktürk (2020); Lobe Morgan and Hoffman (2020) and Secara (2020) etc.

Data Leakage/ Passing of Data:

According to Business Insider, the reliability of Zoom Meet is under a question mark, as the company has been blamed and criticized for passing consumer data to other companies like FaceBook, etc. Although the study also mentioned that zoom never sells any sort of data of its users and only shares that for business purposes. However, these claims are sufficient enough to posit claims on the trustworthiness of the application (Cubukçu & Aktürk, 2020).

H1A: There is a relationship between the use of Zoom Meet for teaching during COVID-19 & Data Leakage/ Passing of Data

H2A: Data Leakage/Passing of Data does mediate between the use of Zoom Meet for teaching during COVID-19 and the intention to switch by faculty members.

Security Vulnerability:

Security issues were also there as Zoom uses Transport encryption that is lesser secure than End-to-End encryption. However, End-to-End encryption was featured by other online businesses and the best advantage of this feature is that it prevents hacking & decryption of data by third parties (Cubukçu & Aktürk, 2020). In fact, zoom itself published a blog that reflects that the encryption used by the zoom is Transport Security Layer (TLS) that encrypts the data between users and zoom servers, hence does not conform with industry standards (Secara, 2020).

H3A: There is a relationship between the use of Zoom Meet for teaching during COVID-19 & Security Vulnerability

H4A: Security Vulnerability does mediate between the use of Zoom Meet for teaching during COVID-19 and the intention to switch by faculty members.

Data Privacy:

Studies like Cubukçu and Aktürk (2020) also indicated that during the pandemic privacy was also one of the most dominant threats for the users of the zoom meet Application. The study claims that Zoom collects personal information like location, name of the school and email addresses, etc along with the IP address of the user's device. Moreover, if anyone uses Facebook to get logged in to zoom that there was a serious threat of data collection from the user's personal profile. Similar sort of claims was also raised by Secara (2020) that referred to a study conducted by Motherboard that user analytics information gathered through the iOS zoom mobile application was transferred to Facebook.

H5A: There is a relationship between the use of Zoom Meet for teaching during COVID-19 & Data Privacy

H6A: Data Privacy does mediate between the use of Zoom Meet for teaching during COVID-19 and the intention to switch by faculty members.

Threats of Cyber Crime:

It is very easy to share Zoom meeting URLs and meeting ids and hence it is very convenient for anyone to join the meeting. Hence it is also an opportunity for cyber criminals to sneak into the meetings and hijack them. Hence legitimate to consider this issue as the major threat as due to the ease of sharing zoom meeting details and URLs, cybercriminals have the liberty to reach any sort of data associated with the call (Cubukcu & Akturk, 2020).

H7A: There is a relationship between the uses of Zoom Meet for teaching during COVID-19 & Threat of Cyber Crime

H8A: Threat of Cyber Crime does mediate between the use of Zoom Meet for teaching during COVID-19 and the intention to switch by faculty members.

H9A: Preference of Zoom Meet does moderate the relationship between leakage/passing of data and intention to switch by faculty members.

H10A: Preference for Zoom does moderate the relationship between the privacy of data and the intention to switch by faculty members.

H11A: Preference for Zoom Meet does moderate the relationship between the security vulnerability of data and the intention to switch by faculty members.

H12A: Preference of Zoom does moderate the relationship between cybercrime and intention to switch by faculty members.

Research Methodology

Research Methodology is a comprehensive term for highlighting the process of conducting research. Every research may have a different methodology and the section of research methodology may include parameters like research design, data gathering, and data analysis. The real purpose of research methodology lies in highlighting the purpose of research, defining the research problem, discussing the development of hypotheses, and method to collect & analyze data with facts about the use of particular statistical techniques (Goundar, 2012). There are two major sub-divisions of the sections i.e., research design and sampling design (Sileyew, 2019).

Research Design:

The research has been conducted to evaluate the perception related to the use of the zoom meet Application according to the perception of faculty members of higher education institutions from Pakistan.

Therefore, it is the study that enhanced the research work on the relevant area like Cubukçu and Aktürk (2020); Lobe Morgan and Hoffman (2020), and Secara (2020), etc, but from Asian and developing sides of the world. On the other side, Sileyew (2019) indicated that the major purpose of

the research design is to justify the data collection approach and technique to solve the particular problem. Hence, the purpose of research is aligned with epistemology as the philosophy of research as it is the philosophy of knowledge (Audi, 2010) as indicated by Saunders et al (2007).

Although study of Saunders et al (2015) indicated use of philosophical stance to relate the philosophy of research with the research approach and technique of data analysis. In this regard, positivism is found to be aligned with quantitative research (Devers, 1999). However, post-positivism is applicable to both qualitative and quantitative techniques (Henderson, 2011) and also favors the quantitative research technique (Ospina et al., 2018). Thus, for a better analysis of a complex research model post-positivism is used as the research stance as it is preferred for studies and education and social sciences for confirmation of findings by prior qualitative and quantitative research (Panhwar et al., 2017). The approach of research is deductive, the research strategy is survey, and the time horizon is cross-sectional (Saunders et al., 2007)

Sampling Design:

For this study, data has been collected from faculty members of higher education institutions, that were involved in teaching through using the zoom meet application on the eve of COVID-19. Hence the data has been collected by using non-probability sampling as used by Erito (2021), through using an online questionnaire supplemented with a Likert scale. However, Erito (2021), collected data from students regarding their experience with Zoom Meet during COVID-19 although Rahayu and Wirza (2020) and Vishwanathan et al (2021) gauged the perception of faculty with respect to the online application and their performance during COVID-19. However, Rahayu and Wirza (2020), gauged the perception on generic bases for all the available free online applications & Vishwanathan et al (2021), gauged the perception with respect to the faculty of medicine. Therefore, there is a need to clarify issues associated with different applications separately. Therefore, considering Cubukçu and Aktürk (2020); Lobe Morgan and Hoffman (2020), and Secara (2020), etc for the issues related to the zoom meet application this study has been conducted purposively to evaluate the issues of zoom meet. On the other side, the sample size of prior studies like Cubukçu and Aktürk (2020); Joia and Lorenzo (2021), and Secara (2020) etc were too small in fact most of the studies are qualitative with minimal sample sizes. Therefore, in order to evaluate findings numerically, this study has been supplemented with a sample size of 150 Respondents (faculty members), in order to legitimize the findings. The sample size is legitimate as it is consistent with the indication of minimum sample size for SMART-PLS Singkheeprapha et al (2021) and Ramayah et al (2016).

Questionnaire:

The questionnaire used has been an adapted version of the elements used by studies like Bawanti and Arifani (2021); Boland et al (2021); Hamid et al (2020); Kumar et al (2020); Minhas et al (2021)

Statistical Testing and Analysis

SMART-PLS is the software that is recommended when the model is complex (Purwanto et al., 2021), and other than higher-order models the primary form of models in the software are reflective and formative (Wong, 2013). Moreover, when the model is reflective then structural equation modeling is the best technique to run confirmatory factor analysis (Afthanorhan, 2013). Raouf and

Akhtaruddin (2018) provided a detailed method to evaluate reflective models via SEM technique through SMART-PLS. On the bases of these parameters analysis has been made that is given below:

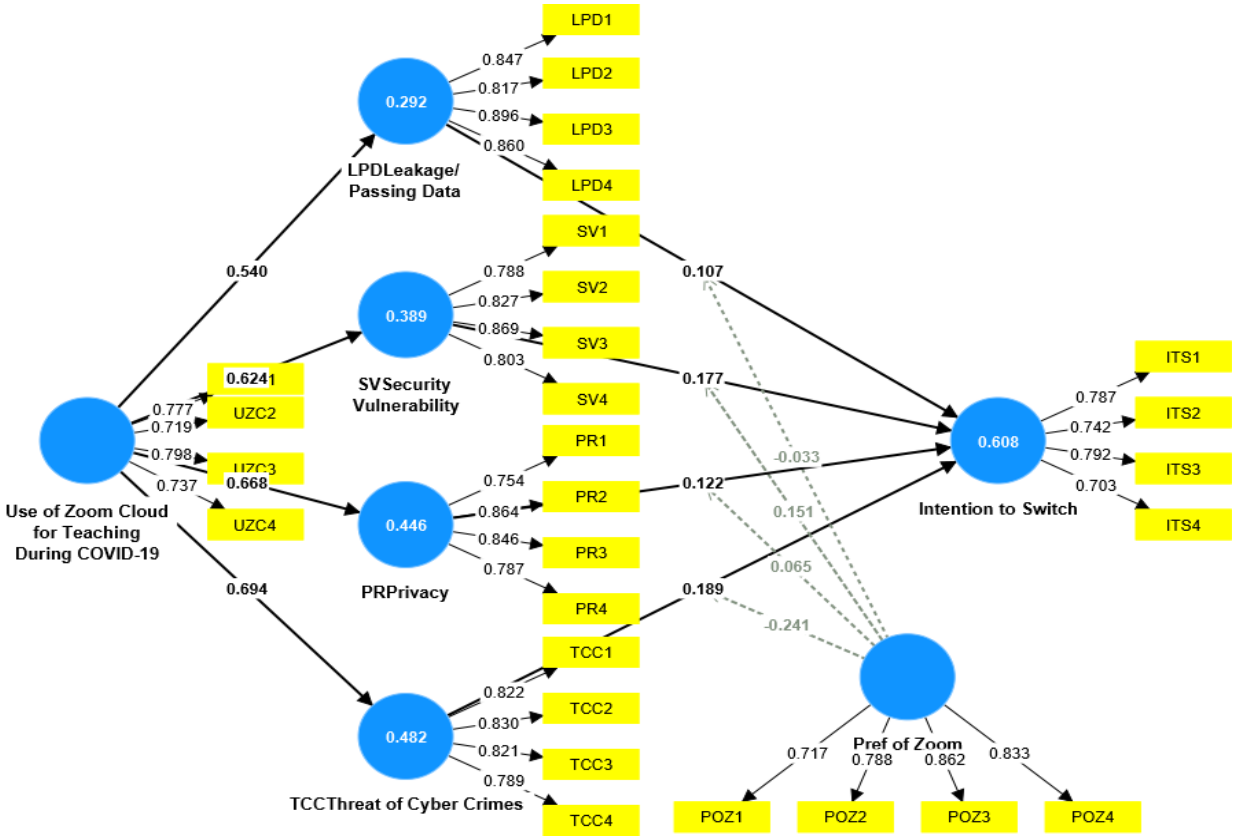

Figure 1: Confirmatory Factor Analysis (Outer Lading)

Figure 1 is indicating outer loading in order to indicate the authenticity of each and every indicator associated with the variable of interest (Sleimi & Emeagwali, 2017). Although the minimum value for each indicator is 0.4 (Hulland & Business, 1999). However, the criteria to evaluate each and every indicator given by Ab Hamid et al (2017) is 0.70 or above which become stronger as the value approaches to 1. However, as per figure 1 the minimum value for any of the indicator is 0.717 that is more than the criteria mentioned above and hence there is no need to delete any of the indicators.

Table 1: Predictive Accuracy (Quality Criteria)

	R-square	R-square adjusted
Intention to Switch	0.578	0.566
Leakage/ Passing Data	0.792	0.757
Privacy	0.654	0.643
Security Vulnerability	0.639	0.625
Threat of Cyber Crimes	0.612	0.601

Table 1 is indicating predictive accuracy through the value of R2 and it is actually a variance caused by any change in the independent variable over the dependent variable (Ringle et al., 2015). The relationship has been determined by ordinary least square (Beniteze et al., 2020), while the minimum value to reflect the relationship is 0.26, 0.5 is the moderate value to show a relationship and 0.75 or above is the benchmark for a substantial relationship (Hair et al., 2011).

Table 2: Construct Reliability & Convergent Validity

	Cronbach's alpha	(rho_a)	Composite reliability	Average variance extracted (AVE)
Intention to Switch	0.751	0.753	0.843	0.573
Leakage/ _Passing Data	0.878	0.895	0.916	0.732
Privacy	0.830	0.841	0.887	0.663
Pref of Zoom	0.813	0.823	0.878	0.643
Security _Vulnerability	0.840	0.850	0.893	0.676
Threat of Cyber Crimes	0.832	0.834	0.888	0.665
Use of Zoom Meet_ for Teaching _During COVID-19	0.754	0.757	0.844	0.575

Table 2 is reflecting construct reliability and convergent validity. Three of the first four columns i.e., Cronbach's Alpha, rho and Composite Reliability are the reliability evaluator while composite reliability and AVE are used to reflect convergent validity. Construct reliability is sufficient and effective as all the indicators have values more than 0.70 which is the criterion given by Sijtsma (2009 a&b). On the other hand, the table also has AVE with more than 0.5 for every case to assure convergent validity (Benitez et al., 2020). Hence table is assuring construct reliability as well as convergent validity.

Table 3 is mentioning the discriminant validity through heterotrait-monotrait ratio. The purpose of the table is to evaluate the difference of understanding for each of the variables by respondents. The ratio is actually the evaluation of understanding the difference in variables conceptually, theoretically, and numerically (Cheung & Lee, 2010). HTMT ratio is the best one to evaluate the difference between variables (Beniteze et al., 2020). The value of the junction must be equal to or lesser than 0.85 (Hair Jr. et al., 2017). Hence in light of these values, it is legitimate to declare the Heterotrait-Monotrait ratio fit and the model is free from the coupling of variables.

Table 3: Discriminant Validity (Heterotrait-Monorait Rat

	Intention to Switch	Leakage / _Passing Data	Privacy	Pref of Zoom	Security _Vulnerability	Threat of Cyber Crimes	Use of Zoom Meet_ for Teaching _During COVID-19	Pref of Zoom x Leakage / _Passing Data	Pref of Zoom x SVSecurity _Vulnerability	Pref of Zoom x Privacy	Pref of Zoom x Threat of Cyber Crimes
Intention to Switch											
Leakage/ Passing Data	0.633										

Privacy	0.827	0.715									
Pref of Zoom	0.841	0.563	0.898								
Security Vulnerability	0.790	0.705	0.831	0.778							
Threat of Cyber Crimes	0.846	0.660	0.831	0.824	0.769						
Use of Zoom Meet_ for Teaching _During COVID-19	0.786	0.648	0.833	0.813	0.774	0.876					
Pref of Zoom x Leakage/ Passing Data	0.415	0.135	0.301	0.428	0.360	0.377	0.407				
Pref of Zoom x Security Vulnerability	0.487	0.290	0.425	0.558	0.449	0.499	0.471	0.698			
Pref of Zoom x Privacy	0.509	0.239	0.459	0.592	0.415	0.514	0.502	0.735	0.815		
Pref of Zoom x Threat of Cyber Crimes	0.594	0.263	0.460	0.599	0.442	0.570	0.590	0.719	0.846	0.821	

Table 4: Path Coefficient

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Leakage/ Passing Data -> Intention to Switch	0.025	0.036	0.060	0.418	0.676
MOD POZ LPD -> Intention to Switch	0.012	-0.022	0.102	0.115	0.908
MOD POZ PRI -> Intention to Switch	0.086	0.088	0.081	1.059	0.290
MOD POZ SV -> Intention to Switch	0.174	0.172	0.099	1.758	0.079
MOD POZ TOCC -> Intention to Switch	-0.281	-0.246	0.147	1.915	0.056
Pref. of Zoom -> Intention to Switch	0.014	0.018	0.016	0.884	0.377
Privacy -> Intention to Switch	0.243	0.242	0.121	2.014	0.045
Security Vulnerability -> Intention to Switch	0.400	0.410	0.126	3.176	0.002
Threat of Cyber Crimes -> Intention to Switch	0.302	0.280	0.105	2.880	0.004
Use of Zoom Meet for Teaching During COVID-19 -> Leakage/ Passing Data	0.931	0.932	0.009	98.253	0.000
Use of Zoom Meet for Teaching During COVID-19 -> Privacy	0.939	0.939	0.014	64.866	0.000

Use of Zoom Meet for Teaching During COVID-19 -> Security Vulnerability	0.952	0.952	0.013	70.531	0.000
Use of Zoom Meet for Teaching During COVID-19 -> Threat of Cyber Crimes	0.946	0.946	0.008	120.429	0.000

Table 4 & Figure 2 is indicating the path coefficient in order to highlight the impact of independent variables as well as moderating impact over the dependent variable (intention to switch). However, according to the value of t-statistics and p-value, there is no relationship between leakage and passing of data on intention to switch of the user. Similarly, the preference for zoom meet does not moderate the relationship of any of the variables (i.e., leakage/passing of data, privacy, security vulnerability & cybercrime), with the intention to switch by faculty members. The indications are true in the light of Hair et al (2019) as the minimum value of t-statistics that may use to reflect the relationship among variables is 1.97 and the maximum p-value that is required is 0.05.

Table 5 is reflecting the specific indirect effect so to highlight the mediation analysis of (i.e., leakage/passing of data, privacy, security vulnerability & cybercrime), between the use of zoom meet for teaching during COVID-19 & intention to switch by the faculty member. Analysis indicated that there is only one case where the mediation has not been proved which is for leakage/passing of data as the mediator between the use of zoom meetings for teaching during COVID-19 & intention to switch by faculty. Although for all the other relationships i.e., data, privacy, security vulnerability & cybercrime the table reflected significant value, and therefore the mediation for the 2nd, 3rd & 4th variables has been registered. The findings of table 4 and table 5 are also consistent with Duarte and Amaro (2018) for p-values and Hair et al (2011) for t-values

Table 5: Specific Indirect Effect

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Use of Zoom Meet for Teaching During COVID-19 -> Leakage/ Passing Data -> Intention to Switch	0.023	0.034	0.056	0.417	0.677
Use of Zoom Meet for Teaching During COVID-19 -> Privacy -> Intention to Switch	0.228	0.228	0.115	1.979	0.048
Use of Zoom Meet for Teaching During COVID-19 -> Security Vulnerability -> Intention to Switch	0.381	0.391	0.124	3.078	0.002
Use of Zoom Meet for Teaching During COVID-19 -> Threat of Cyber Crimes -> Intention to Switch	0.286	0.265	0.100	2.869	0.004

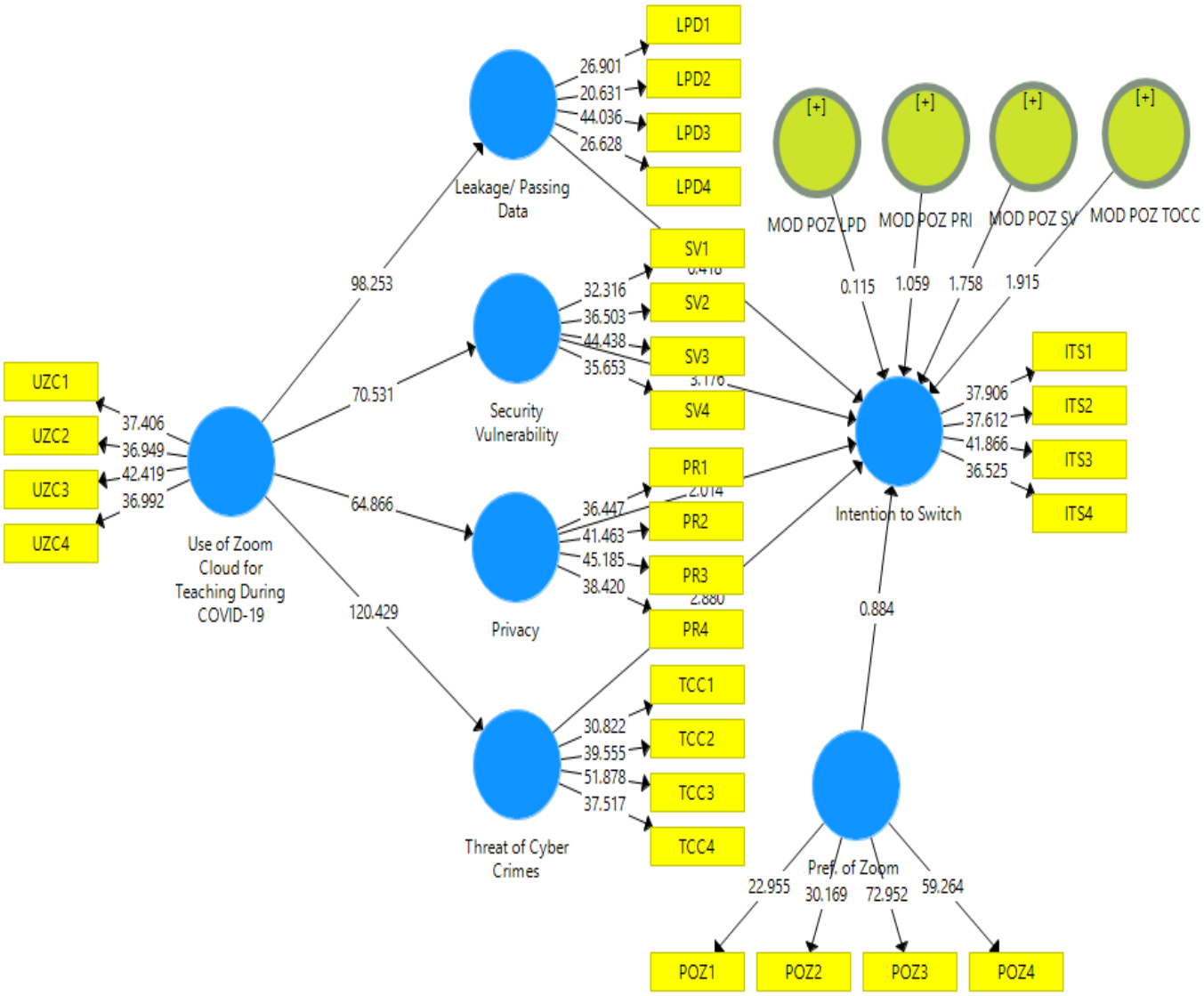

Figure 2: Path Coefficient

Conclusion and Discussion

The findings of the study are consistent with Cubukçu, & Aktürk, (2020) as the threats like data security, privacy, leakage, and cybercrimes are termed as the major reasons for the switch of users. Hence effective to state that the study is not only consistent with the findings Cubukçu, & Aktürk, (2020) but also be consistent with the indications of Lobe Morgan and Hoffman (2020) and Secara (2020). Both of the studies indicated the severity of threats while using zoom meet for teaching & learning. The findings of the study also indicated that there is a negative relationship between the preference for the zoom meet application and the intention to switch of the faculty member and this is consistent with Cubukçu, & Aktürk, (2020). However, it has also been concluded that there the preference for zoom may affect the intention to switch but could not hamper the switch intention due to the perceived threats associated with the use of zoom meetings.

Area for further Research

This study has been done to evaluate the impact of perceived threats associated with the use of zoom meet for teaching & learning. However, the data has been collected through closed-ended questionnaires from the faculty of higher education institutions in Karachi. However, the findings may differ when compared to the other areas of Pakistan. Moreover, teaching and learning is not the only benefit associated with the use of free applications and the use of zoom meet is also associated with the sale and purchase of real estate and other businesses like consultancy and routine office work. Therefore, further studies might be associated with the other fields in order to check the impact of perceived threats indicated by Cubukçu, & Aktürk, (2020) Lobe Morgan and Hoffman (2020), and Secara (2020).

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