CHAPTER FOUR

DATA COLLECTION AND ANALYSIS

4.0. Introduction

This chapter presents the population and sample, research instruments, pre-test, pilot study, and data collection. This chapter also shows the process of the research data analysis and the results of the quantitative study. The data analysis starts by demographic characteristics and response rates among the sample. Next, the screening of the data in preparation for further quantitative analysis is addressed. The items are clarified by exploratory factor analysis to identify their factors. The results from the exploratory factor analysis are measured again by confirmatory factor analysis. Subsequently, the structural model and the research hypotheses are tested. Finally, the structural model is evaluated by the coefficient parameter estimates with the goodness-of-fit indices.

4.1. Population and Sample

Polit and Beck (2004: P 232) describe a population as *"the totality of all subjects that conform to a set of specifications comprising the entire group of persons that is of interest to the researcher and whom the research results can be generalized"*. Oppenheim (1992: P 38) defines *"'sample' is used to indicate a smaller group, usually but not always a representative one, within a population"*.

Cloud computing adopting is at an early stage in Malaysian public universities. During this research is conducted; there is one university in Malaysia adopts cloud based e-learning. Therefore, it is quite difficult to get experts in the field of cloud based e-learning. Therefore, after reviewing literature and dialogue with the supervisors, the

population target of this research is the academic staff members and staff members of ICT center in UPSI as they have experiences in e-learning, information security or cloud computing. This is also because they are the most effective people who know the issues of cloud computing and e-learning. This research applies comprehensive survey method to collect the data by distributing questionnaires to all population because of the limited number of the population. However, a lot of effort is made to increase the number and quality of responses.

4.2. Research Instruments

A survey instrument is used in this study to gain cloud based e-learning users' perceptions. Developing instrument is an important task and intended to capture respondents' perception about cloud computing, and other factors that influence information privacy concerns. The instrument is designed based on the findings from the extended literature review of the theoretical framework presented in the earlier chapter with a particular focus on the key role of the information privacy concerns of cloud computing in order to achieve the research objectives. The whole questionnaire is attached in appendix A.

The questionnaire has been prepared in such a way to conclude the research questions in an accurate manner. It takes into account the wording of questions covering all aspects of the literature review, and to meet all the requirements and the constructs of the proposed framework, taking into account that most of the questions are clear and their endings are closed for ease and speed of answer and ease of analysis.

The preliminary questionnaire contains 46 questions. These questions are prepared to measure the research framework's constructs. According to Moore and Benbasat (1991) in order to measure every construct, at least, one item should be established. Some of the questions are adapted from a very well-known instrument developed (Malhotra, Kim, &

Agarwal, 2004; Smith, Dinev, & Xu, 2011) and modified based on the context of cloud based e-learning while other questions are specially designed to be used in this research.

The questionnaire is structured and divided into four parts as attached in appendix A. The first part revolves around demographic information. Even though the demographic questions are not a part of the proposed framework, the gender, qualification level and job titles are included to investigate any bias in the sample. Besides, it could provide further analyzing options in future work such as comparing these variables to other variables to discover some interesting correlations.

The second part is an important part which focuses on user information privacy concern. It applies the research model of internet users' information privacy concerns (IUIPC) (Malhotra et al., 2004) that includes three variables, collection, control, and awareness. The third part of this questionnaire is the questions that measure the factors that may have an effect on cloud computing user's information privacy which are the questions that measure access, compliance, storage, retention, destruction, audit and monitoring, and information privacy breaches. The fourth part includes the information privacy concerns as variable based on the (Smith et al., 2011), trusting beliefs and risk beliefs which explain an individual's release of personal information (Malhotra et al., 2004).

Items are developed based on a 7-point Liker-type scale (Strongly disagree, Disagree, Somewhat disagree, either agree or disagree, somewhat agree, Agree, Strongly agree) because the most question of the instrument is adopted from Malhotra et al. (2004) and Smith, Milberg, and Burke (1996), which use 7-point Liker-type scale. Moreover, the questionnaire contains detailed, brief and clear instructions, and is created to prompt an ease of response. Respondents were notified by a cover letter which explains the purpose of this research, the aim of the research. Respondents are assured of privacy and confidentiality in order to encourage high response.

4.2.1. Validity of The Measurement

- Pre-Test

Prior to finalizing the questionnaires, a pre-test of the questionnaire is possessed before the pilots study in order to ensure the questions are understandable to the respondents and that the questionnaire would succeed as a research instrument for collecting data. However, the main constructs of the questionnaire and questions for each construct are identified and an initial questionnaire is prepared. According to Saunders and Lewis (2000), the questionnaire should be checked by specialists for ensuring the standard and quality of the language. While the questionnaire is written in English, it is necessary to note that English is not the native language of the author. Therefore, the questionnaires have gone through a sequence of vigorous reviews with colleagues who have experience on the topic and by the supervisors who provide valuable suggestions and instructions. Then it is sent to three experts (a Professor in Statistics and Quantitative Management from the Universiti Sultan Zainal Abidin with experience more than 20 years, a lecturer in the English language from Cambridge International School with experience more than 7 years, and a Ph.D. student from Universiti Sains Islam Malaysia with 3 years of experience). Based on their comments, the questionnaire is modified. This is done by keeping in mind the research questions and finally come up with a set of error-free questions. Then, the pilot study is conducted.

- Pilot Study

The participants of pilot study involved e-learning administrators and e-learning staff who are experts on e-learning, information security, and cloud computing. Because they are the most effective people who know the issues of cloud computing and e-learning. Moreover, e-learning centers administrators are responsible for implementing e-learning. For this study, the data is gathered via survey distributed to practitioners from e-learning centers of two Malaysian public universities Universiti Sains Islam Malaysia

(USIM), and Universiti Pendidikan Sultan Idris (UPSI)). The pilot study is distributed to 26 practitioners; 24 responded, resulting in 92% response rate. The questionnaire items are coded as well as the negative questions reverse. The pilot study data is analyzed using statistical package for social sciences (SPSS) version 22.0.

- Reliability of the Measurement

The survey is replicated with same samples drawn from the population two times. The most common method to check reliability is by using Cronbach's alpha. Cronbach's Alpha test can be carried out on all scales in this study to verify the internal reliability. The range of Cronbach's coefficient alpha value is between 0 and +1.00. Higher values reflect a higher degree of internal consistency. George and Mallery (2003) provide the following rules of Cronbach's alpha values, value above 0.9 is given the status "excellent", above o.7 "Good", from 0.7 to 0.6 was "Questionable", from 0.6 to 0.5 are considered "Poor", while those below the value 0.5 were considered "Unacceptable". Generally, it is accepted for Cronbach's Alphas to have a value higher than 0.7. In this pilot study, the Cronbach's Alpha test for all components is more than the acceptable level (> 0.7) range between 0.811to 0.972 as displayed in Table 4.1.

TABLE 4.1: Cronbach's Alpha for Each Component of the Instrument

NO	Factor	Code	Number of Items	Cronbach's Alpha	Description
1.	Data Collection	DC	3	.890	Good
2.	Control	CO	3	.926	Excellent
3.	Awareness	AW	3	.940	Excellent
4.	Access	AC	3	.882	Good
5.	Compliance	CM	3	.888	Good
6.	Storage	ST	4	.826	Good
7.	Retention	RE	3	.881	Good
8.	Destruction	DES	4	.857	Good
9.	Audit and monitoring	AM	4	.909	Excellent
10.	Information privacy breaches	PB	3	.843	Good
11.	Information privacy Concern	PC	4	.972	Excellent
12.	Risk Beliefs	RB	4	.811	Good
13.	Trusting Beliefs	TB	5	.932	Excellent

- Construct validity

Construct validity refers to the ability of a measurement tool (e.g., a survey, test, etc) to actually measure what is designed to measure (Phelan & Wren, 2006). In another word, if the measuring instrument measures what it is supposed to measure (Golafshani, 2003). There are two types of construct validity: convergent and discriminant validity. In this pilot study, convergent validity is assessed by factor loading and Average Variance Extracted (AVE). However, all of the factors have, at least, three questions (the questionnaire item). According to Hair, Black, Babin, Anderson, and Tatham (2010) the acceptable factor loading should be greater than 0.5. However, factor loading with higher than 0.7 is considered excellent (Hair et al., 2010). The Discriminant validity is assessed by comparing the shared variance (correlation) between each pair of constructs against the squared average of the AVEs for these two constructs (Fornell & Larcker, 1981). In another word, the square root of AVE should be much larger than the correlation of constructs. The value of AVE for each construct should be at least 0.50 (Fornell & Larcker, 1981).

- Results of Convergent Validity

Factor analysis is used to measure the basic structure for the sixty-four items and thirteen factors. As displayed in Table 4.2, all the items are more than acceptable level factor loading (> 0.5). In addition, this study used AVE to test the convergent validity. All factors are at an acceptable level of AVE which is between ranges of 0.624 to 0.901.

TABLE 4.2: Factor Loading for Each Item of the Instrument

NO	Factor	Code	Items	Factor loading	AVE
1.	Data Collection	DC	DC1	.848	0.757
			DC2	.864	
			DC3	.898	
2.	Control	CO	CO1	.893	0.733
			CO2	.785	
			CO3	.887	
3.	Awareness	AW	AW1	.859	0.797
			AW2	.866	
			AW3	.950	
4.	Access	AC	AC1	.812	0.624
			AC2	.775	
			AC3	.782	
5.	Compliance	CM	CM1	.884	0.743
			CM2	.851	
			CM3	.851	
6.	Storage	ST	ST1	.909	0.779
			ST2	.895	
			ST3	.872	
			ST4	.853	
7.	Retention	RE	RE1	.955	0.779
			RE2	.895	
			RE3	.789	
8.	Destruction	DES	DES1	.818	0.703
			DES2	.807	
			DES3	.877	
			DES4	.851	
9.	Audit and monitoring	AM	AM1	.911	0.753
			AM2	.916	
			AM3	.820	
			AM4	.819	
10.	Information privacy breaches	PB	PB1	.811	0.722
			PB2	.869	
			PB3	.868	
11.	Information privacy Concern	PC	PC1	.957	0.901
			PC2	.957	
			PC3	.969	
			PC4	.913	
12.	Risk Beliefs	RB	RB1	.877	0.701
			RB2	.819	
			RB3	.800	
			RB4	.851	
13.	Trusting Beliefs	TB	TB1	.869	0.788
			TB2	.927	
			TB3	.905	
			TB4	.886	
			TB5	.850	

- Results of Discriminant validity

Table 4.3 illustrated comparing of the shared variance (correlation) between each pair of constructs against the average of the AVEs for these two constructs. As shown in Table 4.3, the square root AVE of any two constructs is much larger than the correlation of them. Thus, the results of measuring convergent validity reveal good construct validity.

TABLE 4.3: Discriminant Validity

	DC	CO	AW	AC	CM	ST	RE	DES	AM	PB	PC	RB	TB
DC	**0.870**												
CO	.421	**0.856**											
AW	.210	.720	**0.893**										
AC	.594	.809	.681	**0.790**									
CM	.330	.498	.594	.472	**0.862**								
ST	.245	.412	.558	.272	.673	**0.883**							
RE	.491	.586	.660	.585	.295	.522	**0.882**						
DES	.009	.408	.710	.456	.375	.277	.334	**0.839**					
AM	.133	.444	.663	.425	.263	.406	.351	.692	**0.868**				
PB	.568	.324	.402	.378	.079	.280	.557	.388	.456	**0.850**			
PC	.162	.557	.711	.446	.254	.305	.530	.631	.723	.563	**0.949**		
RB	.335	.620	.696	.638	.338	.331	.474	.723	.736	.582	.718	**0.837**	
TB	.536	.696	.785	.676	.508	.548	.793	.509	.604	.608	.682	.706	**0.888**

The results indicate that the questionnaire has the ability to be valid and reliable instrument for measurement of cloud based e-learning users' information privacy concerns. This instrument is the first assessment tool in this area as a basis for ongoing research.

4.3. Data Collection Procedure

The procedure of data collection begin by sending an email to (Chief Information Technology Officer, ICT center, UPSI) to ask for a meeting and get his support and more information about the university. The university portal is used to gather the Emails list and contact members for the respondents.

In the first stage of collecting data (15 July 2015), an email is sent with an explanation of the proposed of the research and the link of online questionnaires which used Survey Monkey, (prominent software in the market) to all respondents of the e-learning center and the academic staff members of the Faculty of computing science. This technique does not reach a large number of respondents. Only 12 respondents complete the survey. This is consistent with what Cooper and Schindler (2003) have asserted that although, the Email and online questionnaires are low-cost, anonymous and can be expanded to a large geographical coverage, they suffer from a low response rate.

In the second stage of collecting data (5th of October 2015 until 10th of January 2016), a different method is used to increase the response rate by drop –and- collect survey (DCS) approach. As the name implies, the drop –and- collect approach involves the researcher to drop the questionnaire and collect it after a period of time either directly to the target respondents or indirectly via a gatekeeper (e.g. a secretary). Ibeh, Brock, and Zhou (2004) provide empirical evidence that the DCS method raises the response rate better than the mail and email methods. In total, 216 questionnaires are returned out of 223, which represent a response rate of 96.86% of the original sample.

4.4. Main Data Analysis

4.4.1. Demographic Information

This section presents the demographic characteristics of the respondents of the survey questionnaire process (gender, the level of education and occupation). A total of 223 questionnaires are distributed to UPSI users. 216 responses are received representing 96.86% rate of response. To present and analyze the respondent's demographic characteristics, the researcher uses the percentage and the descriptive statistics. The demographic details of the participants are shown in Table 4.4. Table 4.4indicates that the respondents gender are the (57.4% n=124) males, and only (43.6% n=92) are females. The level of education shows that the respondent holds Bachelor degree with (39.4%, n=85), the Master's degree are (15.7%, n=34) and PhD are (44.9%, n=97). Furthermore, the respondents' Job are lecturers (60.6%, n=131) and staff members in ICT center (39.4%, n=85).

TABLE 4.4: Demographic Details

Variable	**Category**	**Frequency**	**Percent**
Gender	Male	124	57.4%
	Female	92	42.6%
Variable	**Category**	**Frequency**	**Percent**
Education level	Bachelor degree	85	39.4%
	Master degree	34	15.7%
	PHD	97	44.9%
Variable	**Category**	**Frequency**	**Percent**
Occupation	ICT Centre staff	85	39.4%
	lecture	131	60.6%

4.4.2. Descriptive Statistics

Prior to assessing the measurement scales, descriptive statistics is conducted after completion of the data collection. In order to reveal the central tendency and dispersions of the variables, the mean and the standard deviation are initially calculated. The results of the descriptive statistics are illustrated in Table B.1 in Appendix B.

4.4.3. Data Preparation and Screening

The accuracy of data is necessary for analyzing the responses of participants. Many issues such as missing data and normality have an impact on the outcome of variables or the relationships of variables. Thus, for the honest analysis of main data, these issues must be a prior consideration and resolved by data screening (Tabachnick, Fidell, & Osterlind, 2001). In this stage, the missing values in the questionnaires are removed prior to analysis. Then, the assessment of normality is examined. Data screening is coded using SPSS version 22.0 for statistical analysis.

- Missing Data

Missing data usually occurs when a respondent fails to answer one or more survey questions. According to Hair, Black, Babin, Anderson, and Tatham (2006) there are two types of missing data. First, data that is classified as ignorable missing data which are expected and part of the research design and specific remedies for missing data are not needed because the allowances for missing data are inherent in the technique used. Second, missing data that cannot be classified as ignorable occur for many reasons and in many situations (Hair et al., 2006). This occurs when the respondent does not answer one or more survey questions or errors occur during data entry. In the current study, very little missing data is reported. It is all about the respondents' demographic information, which is not significant because it is not the part of the structural modeling of causal relationships. However, none of the items had more than 1 percent of missing

observations. The maximum percentage of missing data is 0.5 percent. This amount is very low and can be considered acceptable.

- Assessment of Normality

Following the assessment of missing data, the normality of distribution of the data is assessed. Normality is a fundamental assumption in multivariate analysis, particularly in structural equation modeling. If the variation from the normal distribution is sufficiently large, resulting statistical tests are invalid (Hair et al., 2006; Tabachnick et al., 2001). In the current study, the normality of variables is assessed through Skewness and Kurtosis statistics. Kurtosis is the 'peakedness' or the 'flatness' a measure of the distribution compared to the normal distribution (Hair et al., 2006). For the measure of skewness and kurtosis, a value of zero indicates a perfectly symmetrical distribution, while negative (right-tailed) and positive (left-tailed). Usually, values for Skewness and Kurtosis of between -1 and +1 demonstrate a reasonably normal distribution (Bachman, 2004). In this study, the values of Kkewness and Kkurtosis as shown in Table B.2 in Appendix B within their respective predicted ranges (-1 and +1). Thus, this data supports normality very well.

4.4.4. Reliability

In statistical terms, the usual way to look at reliability is based on the idea that individual items (or sets of items) should produce results consistent with the overall questionnaire. Reliability can be estimated via different methods. Cronbach's alpha is the most common method to measure the reliability. The internal consistency of a scale is an important measurement property as it implies that items of the scale, notwithstanding their distinctiveness and specificity, share a common core and measure the same concept (Anderson & Gerbing, 1988; Netemeyer, Bearden, & Sharma, 2003). Theoretically, the coefficient alpha is concerned with the degree of interrelatedness among a set of items designed to measure a single construct (Netemeyer et al., 2003). According to (De Vaus, 2013; Nunnally, Bernstein, & Berge, 1967) the acceptable level of Cronbach's alpha

should be 0.70 or more. The Cronbach's alpha is estimated and is shown in Table B.3 in Appendix B for every construct.

Since these three items exhibited collection construct which contains DC1, DC2, andDC3 are less than Cranach`s Alpha acceptable level (< 0.7) and because they fail to reach the minimum required for reliability, the collection construct should be dropped from further analysis.

4.4.5. Exploratory Factor Analysis

This section explains the analysis of the collected data going through the reliability and exploratory factor analysis.

- Communalities

According to Tabachnick et al. (2001) communality is the total of squared loadings for variable across factors. A variable that has no specific variance (or random variance) would have a communality of 1, while a variable that shares none of its variance with any other variables would have a communality of 0 (Field, 2009). A model containing multiple constructs requires 0.5 or less for communalities and 0.7 or less for larger sample size for model stability (Hair et al., 2010). However, according to (De Vaus, 2013) variables with communalities of less than 0.5 should be dropped from the analysis because they are deemed as not contributing to the variance explained. The results demonstrate that most the variables in the factor loading have communality values at the acceptable level ranging from 0.575 to 0.930 except DES3 (478) and TB4 (477). Thus, these two items are dropped. The results of the communality values are illustrated in Table B.4 in Appendix B.

- Eigenvalue

Eigenvalue and variance are used to identify the number of factors to extract, which indicates the substantive importance of the factor (Nunnally et al., 1967) According to Tabachnick et al. (2001) a quick estimate of a number of factors is obtained from the size of the eigenvalue reported as part of an initial run with principal component extraction. Each variable for component analysis variance contributing 1, thus is not important for a component with an eigenvalue less than 1 (Field, 2009; Hair et al., 2010; Tabachnick et al., 2001). Therefore, factors are considered significant for eigenvalue greater than 1; and all factors with latent roots less than 1 are considered not significant and are disregarded (Hair et al., 2010). In this study, there are twelve extracted factors from the data which have an eigenvalue greater than 1as shown in Table B.5 in Appendix B.

- Scree Plot

The numbers of extraction factors are identified by eigenvalues while scree plot is primarily used to confirm the maximum number of factors by examining the graph. Basically, a scree plot extracts the optimum number of factors before the amount of unique variance begins to dominate the common variance structure (Cattell, 1966). In this study, the number of factors based on a screen plot test on data is confirmed as the same with extracted factors through eigenvalue as showed in Figure 4.1.

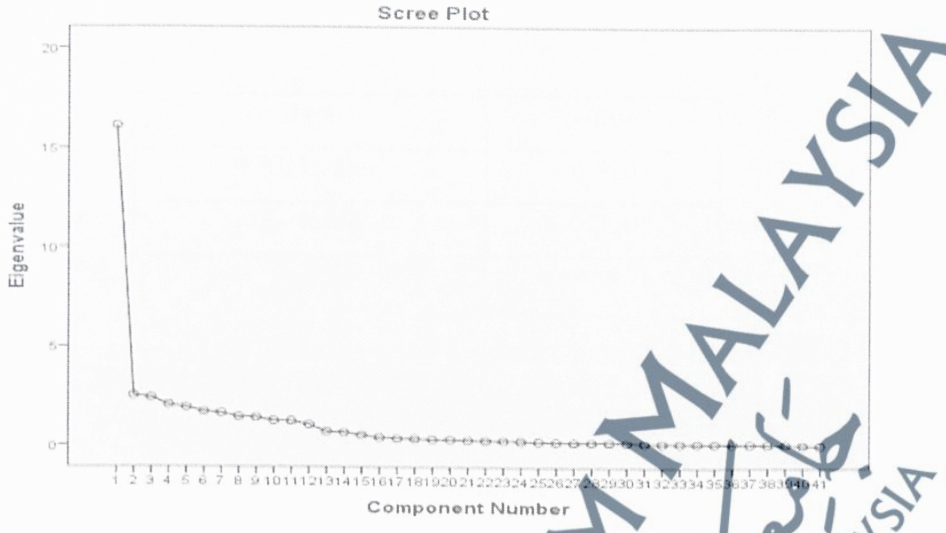

FIGURE 4.1: Scree Plot

- KMO and Bartlett's Test

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy has been computed to determine if using factor analysis is suitable (Norusis, 1992) . Hinton, McMurray, and Brownlow (2004) observe that the closer the KMO value is to 1, the better and an acceptable KMO value is> 0.6. On the other hand, Bartlett's test of Sphericity aims to determine the relationship between the variables. Hair et al. (2006) claim that the analysis of factors can be discarded if there is no relationship between the variables. It is generally recommended that p-value < 0.05 means there is a relationship between the variables and it is appropriate to continue with the factor. Therefore, there are relationships between the variables and it is appropriate to continue with the factor analysis. However, Table 4.5 shows that the Kaiser-Meyer-Olkin measure of sampling adequacy of this study is above the acceptable value of 0.6 as it is 0.896 and the Bartlett's test is significant at (p-value = 0.000). The results confirm that this data is suitable for factor analysis.

TABLE 4.5: KMO and Bartlett's Test

Test	value
KMO value	0.896
P- value	0.000

- Rotated Component Matrix

After using EFA analysis, there are some changes in the number of observed variables in each factor. The new factors include variables expressed in the Rotated Component Matrix table. The result is shown in Table B.6 in Appendix B.

4.4.6. The Measurement Model and Confirmatory Factor Analysis

Developing the measurement model is essential to confirm the relationships between a construct and its indicators. This model is assisted by confirmatory factor analysis. After estimating the measurement model, the structural model is applied to show the causal relationships among the variables (Anderson & Gerbing, 1988; Chau, 1997; Diamantopoulos, 1999).

4.4.7. Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) is conducted after the exploratory factor analysis (EFA). In this research, the CFA method is conducted to assess the unidimensionality, validity, and reliability of construct. Then, the goodness of fit (GOF) is calculated. The details of the CFA are explained as follows.

- Assessing the Unidimensionality

Unidimensionality is achieved when all measuring items have acceptable factor loading for respective latent construct. In order to ensure Unidimensionality, a measurement model of any item with low factor loading should be deleted. On another word, any item hasfactor loading less than 0.6 and R^2 less than 0.4 should be deleted. Table B.7 in Appendix B shows the factor loading and R^2.

The result of Table B.7 in Appendix B indicates factor loading of three items (ST3, AM4, and RB1) are less than 0.6 and R^2 less than 0.4. Therefore, these items are dropped from further analysis.

- Convergent Validity and Reliability

Convergent validity refers to the degree to which measures of two different constructs are appropriately consistent with one another (Houston, 2004). Convergent validity is achieved by calculating average variance extracted (AVE) using a formula 4.1 suggested by (Hair et al., 2010). Furthermore, 'Composite reliability', also called 'construct reliability', is a measure of reliability and internal consistency of the measured variables representing a latent construct. Composite reliability is a principal measure used in assessing the overall reliability of the measurement model, for every latent construct in the model. Composite reliability scores should be greater than 0.70, which indicates that the measures all consistently represent the same latent construct (Hair et al., 2006; Nunnally et al., 1967). In this study, composite reliability is calculated using a formula 4.2 suggested by (Fornell & Larcker, 1981; Hair et al., 2010).

FORMULA 4.1: Computing Average Variance Extracted

$$AVE = \frac{\sum_{i=1}^{n} \lambda_i^2}{n}$$

Note: in the formula mentioned above λ represents factor loadings (standardized regression weights) and i represents the total number of items.

FORMULA 4.2: Computing Constructs Reliability

$$CR = \frac{(\sum_{i=1}^{n} \lambda_i)^2}{(\sum_{i=1}^{n} \lambda_i)^2 + (\sum_{i=1}^{n} \delta_i)}$$

Note: in the formula mentioned above λ represents factor loadings (standardized regression weights) and i represents total number of items, and δ represents the error variance term for each latent construct.

In this study, the factor loadings of the construct, average variance extracted (AVE), and construct reliability (CR) estimation are used to assess the convergent validity of each of the constructs. A minimum cut off criteria for standardized regression loadings > 0.7, AVE > 0.5 and reliability > 0.7) are used to assess the convergent validity. Results are presented in Table B.8 in Appendix B.

The results indicate high levels of composite reliability (CR is greater than 0.6) and AVE for all latent constructs (AVE is greater than 0.50) which means convergent validity is confirmed.

- **Discriminant Validity**

Discriminant validity is defined as the extent to which the indicators of one construct are distinct from the items of other latent variables (Bagozzi, Yi, & Phillips, 1991; Peter, 1981; Peter & Churchill Jr, 1986). It is assessed by using average variance extracted (Fornell & Larcker, 1981; Hair et al., 2010). Discriminant validity can be calculated by comparing the squared correlation between two constructs with the variance extracted between these two constructs. Results of AVE should be greater than the squared correlation estimates (Fornell & Larcker, 1981; Hair et al., 2010). In this study, the square roots of AVE are compared with the correlations between this dimension and others in the measurement model. Based on this approach, this study finds discriminant validate to all latent constructs. The results in Table B.9 in Appendix B show that values of all AVE are greater than relevant squared correlation estimates, thereby discriminant validity is confirmed.

4.4.8. Result of Fit Indices

In this study, the final measurement model is fit. After the deletion of all the above items, the measurement model has a suitable fit with the following indices. Consequently, the acceptable fit of the measurement model could be judged. Tucker Lewis index (TLI) = 0.935, comparative fit index (CFI) = 0.945, root mean square error of approximation (RMSEA) = 0.067 and Chi-Square/Degrees of Freedom ($\chi 2/df$) = 1.979. At the end of the analysis, the 38 items are satisfactory for the model fit.

4.4.9. Items Dropped

In summary, the results show that the internal consistency of the constructs of the study is relatively high as for Cronbach's alpha is greater than 0.7 for all the constructs except the data collection construct. Most the variables in the factor loading have communality values at the acceptable level ranging from 0.575 to 0.930 except

DES3 and TB4. Moreover, factor loading of three items (ST3, AM4, and RB1) is less than 0.6 and R2 less than 0.4. Table 4.6 summarizes all items that has been dropped.

TABLE 4.6: All Dropped Items

Construct	Items dropped	Reasons for dropping the items
Data collection	DC1, DC2, DC3	Low reliability less than 0.7
Storage	ST3	Low Factor loading less than 0.6 R2 less than 0.4
Destruction	DES3	Low communalities less than 0.5
Audit and monitoring	AM4	Low Factor loading less than 0.6 R2 less than 0.4
Risk Beliefs	RB1	Low Factor loading less than 0.6 R2 less than 0.4
Trusting Beliefs	TB4	Low communalities <0 less than.5

4.4.10. Structural Equation Modeling

The Structural Equation Modeling (SEM) methodology provides a reliable way of testing the theory (Hair et al., 2009; Byrne, 2001). The theory is expressed in the form of relationships (structural model) between measured variables and nonobservable latent constructs and then SEM can assess whether the observed data confirm the theoretical assumptions. The purpose of the structural model is to identify the direct or indirect influence of latent constructs to other latent constructs in the model (Byrne, 1989). In Figure 4.2, the research model indicated that the control, awareness, access, compliance, storage, retention, destruction, information privacy breaches, and audit and monitoring is the independent variables; information privacy concerns is a dependent variable and also the information privacy concerns is an independent variable in relation to the trust beliefs and trust beliefs. The model's characteristics of this research are examined and evaluation before testing the relationships. The model consists of 38

observed variables and 58 unobserved variables, which include 38 error terms, 8 residuals, and 12 latent variables.

FIGURE 4.2: The Path Diagram of the Full Model

The structural model testing is conducted after the measurement model is validated and a satisfactory fit achieved (Anderson & Gerbing, 1988). Thus, the theoretical model has been specified to test the eleven direct paths, which are represented in the hypotheses (H2, H3, H4, H5, H6, H7, H8, H9, H10, H11, and H12), along with the indirect paths, which are represented in the hypotheses (H14, H15, H16, H17, H18 H19, H20 H21, H22, H24, H25, H26, H27, H28,H29,H31 and H32). Further details about the hypotheses of this thesis are discussed and the proposed theoretical model is explained in Chapter 2. The latent constructs used in the proposed theoretical model (as described in chapter 2) classified in two main categories for the direct effect: exogenous and endogenous constructs. Exogenous constructs are the control, awareness, access, compliance, storage, retention, destruction, information privacy breaches, and audit and monitoring while endogenous constructs are the information privacy concerns, risk beliefs, and trust beliefs.

- **Results of Direct Effects**

In testing the hypothesized model, results presented in Table 4.9 indicate that all hypotheses H2, H3, H4, H5, H6, H7, H8, H9, H10, H11, and H12are supported. The standardized estimates for these hypotheses are all significant. Furthermore, all path coefficients are significant ($P < 0.05$). The causal relationships among independent constructs awareness, access, compliance, storage, retention, destruction, information privacy breaches, and audit and monitoring are positive and statically significant at the 0.05 level on depending construct information privacy concerns. While control and storage have the strongest effect on information privacy concerns ($p = 0.000$) the findings provide strong empirical evidence for H2, H3, H4, H5, H6, H7, H8, H9, and H10. Also, the path coefficients between information privacy concerns to risk beliefs and from information privacy concerns to trust beliefs are confirmed (significant at the 0.00 level). Thus, hypotheses H11 and H12 are also supported by the findings. Table 4.7displayed the path coefficients of the research model. The hypothesis results as follows:

TABLE 4.7: Path Analysis Results for Direct Effect

	Paths	Standardised Estimate	P (Value)	Result
H2	PC <--- CO	0.255	***	Supported
H3	PC <--- AW	0.171	0.005	Supported
H4	PC <--- AC	0.175	0.003	Supported
H5	PC <--- ST	0.203	***	Supported
H6	PC <--- RE	0.171	0.008	Supported
H7	PC <--- DES	0.185	0.007	Supported
H8	PC <--- CM	0.148	0.007	Supported
H9	PC <--- AM	0.163	0.014	Supported
H10	PC <--- PB	0.214	0.005	Supported
H11	RB <--- PC	0.36	***	Supported
H12	TB <--- PC	- 0.365	***	Supported

(***< 0.001) (**P Value**< 0.05 is Support)

Control has a significant positive effect on information privacy concerns (β = 0. 255, p= 0.000). This is related to hypothesis two which state (H2): Control has a positive effect on information privacy concerns.

The path coefficient between awareness and information privacy concerns is significant (β = 0. 171, p= 0.005). This is related to hypothesis three which state (H3): Awareness has a positive effect on information privacy concerns.

Access has a positive effect on information privacy concerns (β = 0. 175, p= 0.003). This reflects the result of hypothesis number four, which state (H4): Access has a positive effect on information privacy concerns.

There is an insignificant effect of ST on PC (β=0.203, p=0.000). This is related to hypothesis number five, which state (H5): Storage has a positive effect on information privacy concerns.

The path from RE to PC is significantly supported (β=0.171, p=0.008). This is related to hypothesis number six, which state (H6): Retention has a positive effect on information privacy concerns.

In addition, the path coefficient between destruction and information privacy concerns is significant (β = 0. 185, p= 0.007). This is related to hypothesis seven which state (H7): destruction has a positive effect on information privacy concerns.

The path coefficient between CM and PC is significant (β= -0.148, p= 0.007). This is for hypothesis number eight which state (H8): Compliance has a positive effect on information privacy concerns.

There is an insignificant effect of AM on PC (β=0.163, p=0.014). This is related to hypothesis number nine, which state (H9): Audit and Monitoring has a positive effect on information privacy concerns.

The path from PB to PC is significantly supported (β=0.214, p<0.005). This is related to hypothesis number ten, which state (H10): Information privacy breach has a positive effect on information privacy concerns.

PC is insignificantly associated with RB (β=0.36, p=0.000). This reflects the result of hypothesis number eleven, which state (H11): Information privacy concern has a positive effect on risk beliefs.

Furthermore, TB is negatively associated with PC (β= - 0.365, p<0.000). This concerns hypothesis number twelve, which state (H12), Information privacy concern has a positive effect on risk beliefs.

- **Result of Indirect Effects**

Table 4.8 displayed the direct effect of constructs awareness, access, compliance, storage, retention, destruction, information privacy breaches, and audit and monitoring on risk beliefs. While the Table 4.9 displays the direct effect of constructs awareness, access, compliance, storage, retention, destruction, information privacy breaches, and audit and monitoring on trust beliefs.

TABLE 4.8: Summary of Direct Effect on Risk Beliefs

Paths	Standardised estimate	P (Value)	Result
RB <--- CO	0.038	0.656	Not Significant
RB <--- AW	0.057	0.462	Not Significant
RB <--- AC	0.097	0.205	Not Significant
RB<---ST	0.073	0.342	Not Significant
RB<---RE	0.044	0.601	Not Significant
RB<---DES	0.082	0.351	Not Significant
RB<---CM	0.048	0.495	Not Significant
RB<---AM	0.036	0.67	Not Significant
RB <--- PB	0.145	0.139	Not Significant

(**P Value**< 0.05 is Significant)

TABLE 4.9: Summary of Direct Effect on Trust Beliefs

Paths	Standardised estimate	P (Value)	Result
TB<---CO	- 0.038	0.586	Not Significant
TB<---AW	- 0.013	0.842	Not Significant
TB<---AC	- 0.057	0.367	Not Significant
TB<---ST	- 0.067	0.291	Not Significant
TB<---RE	- 0.029	0.679	Not Significant
TB<---DES	- 0.099	0.172	Not Significant
TB<---CM	- 0.141	0.016	Significant
TB<---AM	- 0.039	0.577	Not Significant
TB<---PB	- 0.184	0.024	Significant

(**P Value**< 0.05 is Significant)

In terms of the indirect effect, the relationships among independent constructs awareness, access, compliance, storage, retention, destruction, information privacy breaches, and audit and monitoring are an insignificant direct effect on the depend on risk beliefs construct. Besides, the relationships among independent constructs awareness, access, storage, retention, destruction, and audit and monitoring are an insignificant direct effect on the dependent trust beliefs construct. While the relationships among independent constructs information privacy breaches and compliance have a direct negative effect on trust beliefs construct. However, due to the insignificant direct effect of the most paths on risk beliefs, and trust beliefs as shown in Table 4.8, and Table 4.9, the researcher proposes that information privacy concern mediates the relationship between them.

4.4.10.1. The Procedure to Testing the Mediation of Information Privacy Concerns on Risk Beliefs.

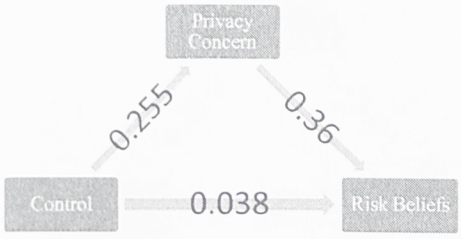

FIGURE 4.3: The Mediation Test of Control on Risk Beliefs

The indirect effect = 0.255* 0.36 = 0918

The direct effect = 0.038

Since indirect effect > Direct effect, the mediation occurs type of the mediation here is complete mediation since the direct effect is not significant after mediator the model as show in Figure 4.3.

The main hypothesis statement for testing a mediator: (H14): Information Privacy Concern of Cloud Based-E-Learning mediates the relationship between Control and Risk Beliefs.

TABLE 4.10: The Result of Mediation Test of Control on Risk Beliefs

Hypothesis Statement of Path Analysis 3 Sub- Hypothesis	Estimate	P-Value	Results
Control has significant effect on information privacy concerns	0.255	0.000	Supported
Information privacy concerns has significant effect on risk beliefs	0.36	0.000	Supported
Control has significant effect on risk beliefs	0.038	0.656	Not Supported

The results of hypothesis testing in Table 4.10 show that information privacy concern plays an important role in supporting the impact of control on risk beliefs. Thus,

the hypothesis is accepted and the type of the mediation here is complete mediation since the direct effect is no longer significant after mediator enters the model.

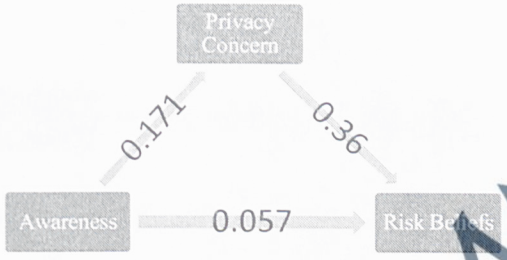

FIGURE 4.4: The Mediation Test of Awareness on Risk Beliefs

The indirect effect = 0.171* 0.36 = 0.616

The direct effect = 0.057

Since indirect effect > Direct effect, the mediation occurs type of the mediation here is complete mediation since the direct effect is not significant after mediator the model as shown in Figure 4.4.

The main hypothesis statement for testing a mediator: (H15): Information Privacy Concern of Cloud Based-E-Learning mediates the relationship between Awareness and Risk Beliefs.

TABLE 4.11: The Result of Mediation Test of Awareness on Risk Beliefs

Hypothesis Statement of Path Analysis 3 Sub- Hypothesis	Estimate	P-Value	Results
Awareness has significant effect on information privacy concerns	0.171	0.005	Supported
Information privacy concerns has significant effect on risk beliefs	0.36	0.000	Supported
Awareness has significant effect on risk beliefs	0.057	0.462	Not Supported

The results of hypothesis testing in Table 4.11 show that information privacy concern plays an important role in supporting the impact of awareness on risk beliefs, thus, the hypothesis is accepted and the type of the mediation here is complete mediation since the direct effect is no longer significant after mediator enters the model.

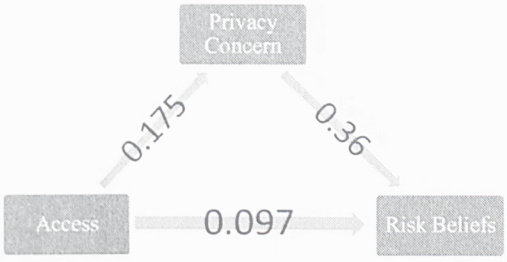

FIGURE 4.5: The Mediation Test of Access on Risk Beliefs

The indirect effect = 0.175* 0.36 = 0.063

The direct effect = 0.097

Since indirect effect < Direct effect, the mediation does not occur.

The main hypothesis statement for testing a mediator: (H16): Information Privacy Concern of Cloud Based-E-Learning mediates the relationship between Access and Risk Beliefs shown in Figure 4.5.

TABLE 4.12: The Result of Mediation Test of Access on Risk Beliefs

Hypothesis Statement of Path Analysis 3 Sub- Hypothesis	Estimate	P-Value	Results
Access has significant effect on information privacy concerns	0.175	0.003	Supported
Privacy concerns has significant effect on risk beliefs	0.36	0.000	Supported
Access has significant effect on risk beliefs	0.097	0.205	Not Supported

The results of hypothesis testing in Table 4.12 indicated that information privacy concern does not mediate the relationship between access and risk beliefs, thus, the hypothesis is rejected.

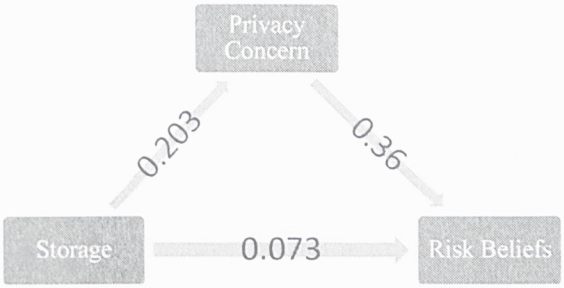

FIGURE 4.6: The Mediation Test of Storage on Risk Beliefs

The indirect effect = 0.203* 0.36 = 0.0731

The direct effect = 0.073

Since indirect effect > Direct effect, the mediation occurs type of the mediation here is complete mediation since the Direct effect is not significant after mediator the model show in Figure 4.6.

The main hypothesis statement for testing a mediator: (H17): Information Privacy Concern of Cloud Based-E-Learning mediates the relationship between Storage and Risk Beliefs.

TABLE 4.13: The Result of Mediation Test of Storage on Risk Beliefs

Hypothesis Statement of Path Analysis 3 Sub- Hypothesis	Estimate	P-Value	Results
Storage has significant effect on information privacy concerns	0.203	0.000	Supported
Privacy concerns has significant effect on risk beliefs	0.36	0.000	Supported
Storage has significant effect on risk beliefs	0.073	0.342	Not Supported

The results of hypothesis testing in Table 4.13 show that information privacy concern plays an important role in supporting the impact of storage on risk beliefs, Thus, the hypothesis is accepted and the type of the mediation here is complete mediation since the direct effect is no longer significant after mediator enters the model.

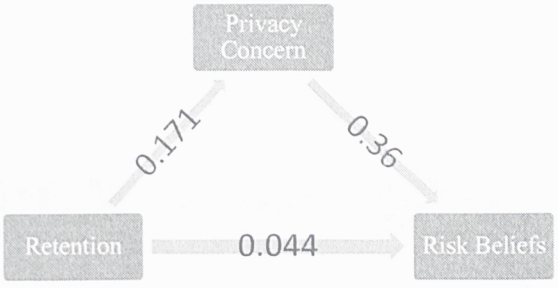

FIGURE 4.7: The Mediation Test of Retention on Risk Beliefs

The indirect effect = 0.171* 0.36 = 0.0616

The direct effect = 0.044

Since indirect effect > Direct effect, the mediation occurs type of the mediation here is complete mediation since the Direct effect is not significant after mediator the model as show in Figure 4.7.

The main hypothesis statement for testing a mediator: (H18): Information Privacy Concern of Cloud Based-E-Learning mediates the relationship between Retention and Risk Beliefs.

TABLE 4.14: The Result of Mediation Test of Retention on Risk Beliefs

Hypothesis Statement of Path Analysis 3 Sub- Hypothesis	Estimate	P-Value	Results
Retention has significant effect on information privacy concerns	0.171	0.008	Supported
Information privacy concerns has significant effect on risk beliefs	0.36	0.000	Supported
Retention has significant effect on risk beliefs	0.044	0.601	Not Supported

The results of hypothesis testing in Table 4.14 show that information privacy concern plays an important role in supporting the impact of retention on risk beliefs, Thus, the hypothesis is accepted and the type of the mediation here is complete mediation since the direct effect is no longer significant after mediator enters the model.

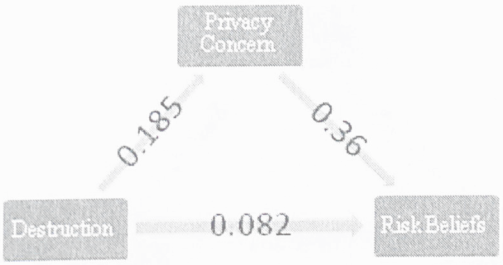

FIGURE 4.8: The Mediation Test of Destruction on Risk Beliefs

The indirect effect = 0.185 * 0.36 = 0.0666

The direct effect = 0.082

Since indirect effect < Direct effect, the mediation does not occur.

The main hypothesis statement for testing a mediator: (H19): Information Privacy Concern of Cloud Based-E-Learning mediates the relationship between Destruction and Risk Beliefs as shown in Figure 4.8.

TABLE 4.15: The Result of Mediation Test of Destruction on Risk Beliefs

Hypothesis Statement of Path Analysis 3 Sub- Hypothesis	Estimate	P-Value	Results
Destruction has significant effect on information privacy concerns	0.185	0.007	Supported
Information privacy concerns has significant effect on risk beliefs	0.36	0.000	Supported
Destruction has significant effect on risk beliefs	0.082	0.351	Not Supported

The results of hypothesis testing in Table 4.15 indicate that information privacy concern does not mediate the relationship between destruction and risk beliefs, thus, the hypothesis is rejected.

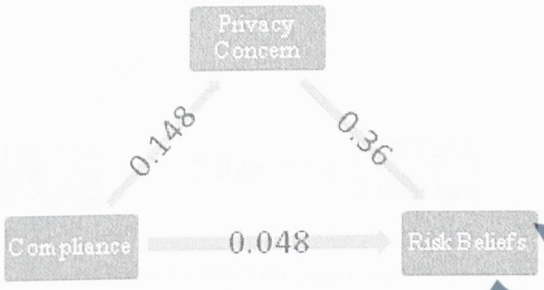

FIGURE 4.9: The Mediation Test of Compliance on Risk Beliefs

The indirect effect = 0.148* 0.36 = 0.053

The direct effect = 0.048

Since indirect effect > Direct effect, the mediation occurs type of the mediation here is complete mediation since the Direct effect is not significant after mediator the model as shown in Figure 4.9.

The main hypothesis statement for testing a mediator: (H20): Information Privacy Concern of Cloud Based-E-Learning mediates the relationship between Compliance and Risk Beliefs.

TABLE 4.16: The Result of Mediation Test of Compliance on Risk Beliefs

Hypothesis Statement of Path Analysis 3 Sub- Hypothesis	Estimate	P-Value	Results
Compliance has significant effect on information privacy concerns	0.148	0.007	Supported
Information privacy concerns has significant effect on risk beliefs	0.36	0.000	Supported
Compliance has significant effect on risk beliefs	0.048	0.495	Not Supported

The results of hypothesis testing in Table 4.16 show that information privacy concern plays an important role in supporting the impact of compliance on risk beliefs. Thus, the hypothesis is accepted and the type of the mediation here is complete mediation. since the direct effect is no longer significant after mediator enters the model.

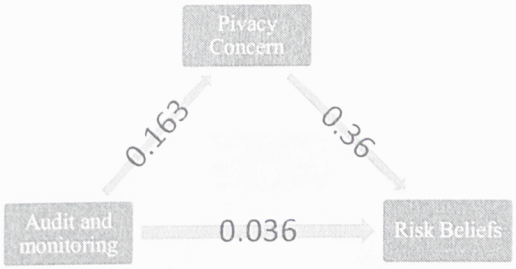

FIGURE 4.10: The Mediation Test of Audit and Monitoring on Risk Beliefs

The indirect effect = 0.163* 0.36 = 0.0587

The direct effect = 0.036

Since indirect effect > Direct effect, the mediation occurs type of the mediation here is complete mediation since the direct effect is not significant after mediator the model shown in Figure 4.10.

The main hypothesis statement for testing a mediator: (H21): Information Privacy Concern of Cloud Based-E-Learning mediates the relationship between Audit and Monitoring and Risk Beliefs.

TABLE 4.17: The Result of Mediation Test of Audit and Monitoring on Risk Beliefs

Hypothesis Statement of Path Analysis 3 Sub- Hypothesis	Estimate	P-Value	Results
Audit and monitoring has significant effect on privacy concerns	0.163	0.014	Supported
Information privacy concerns has significant effect on risk beliefs	0.36	0.000	Supported
Audit and monitoring has significant effect on risk beliefs	0.036	0.670	Not Supported

The results of hypothesis testing in Table 4.17 show that information privacy concern plays an important role in supporting the impact of audit and monitoring on risk beliefs. Thus, the hypothesis is accepted and the type of the mediation here is complete mediation since the direct effect is no longer significant after mediator enters the model.

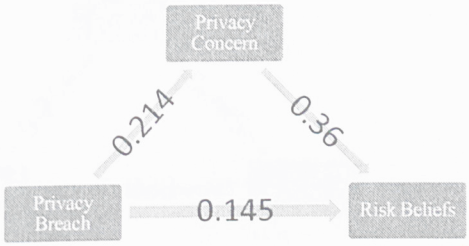

FIGURE 4.11: The Mediation Test of Information Privacy Breaches on Risk Beliefs

The indirect effect = 0.214 * 0.36 = 0.077

The direct effect = 0.145

Since indirect effect < Direct effect, the mediation does not occur.

The main hypothesis statement for testing a mediator; (H22): Information Privacy Concern of Cloud Based-E-Learning mediates the relationship between Information Privacy Breach and Risk Beliefs as shown in Figure 4.11.

TABLE 4.18: The Result of Mediation Test of Information Privacy Breaches on Risk Beliefs

Hypothesis Statement of Path Analysis 3 Sub- Hypothesis	Estimate	P-Value	Results
Information privacy breaches has significant effect on information privacy concerns	0.185	0.007	Supported
Information privacy concerns has significant effect on risk beliefs	0.36	0.000	Supported
Information privacy breaches has significant effect on risk beliefs	0.082	0.351	Not Supported

The results of hypothesis testing in Table 4.18 indicated that information privacy concern does not mediate the relationship between information privacy breaches and risk beliefs, thus, the hypothesis is rejected.

4.4.10.2. The procedure to testing the mediation of information privacy concerns on risk beliefs

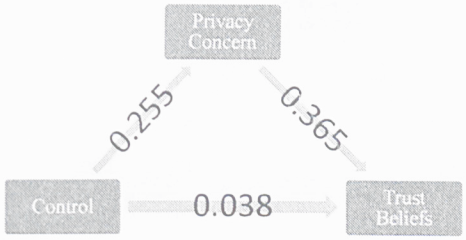

FIGURE 4.12: The Mediation Test of Control on Trust Beliefs

The indirect effect = 0.255* - 0.365 = 0.82

The direct effect = 0.38

Since indirect effect > Direct effect, the mediation occurs type of the mediation here is complete mediation since the Direct effect is not significant after mediator the model shown in Figure 4.12.

The main hypothesis statement for testing a mediator: (H24): Information Privacy Concern of Cloud Based-E-Learning mediates the relationship between Control and Trust Beliefs.

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TABLE 4.19: The Result of Mediation Test of Control on Trust Beliefs

Hypothesis Statement of Path Analysis 3 Sub-Hypothesis	Estimate	P-Value	Results
Control has significant effect on information privacy concerns	0.255	0.000	Supported
Information privacy concerns has significant effect on trust beliefs	- 0.365	0.000	Supported
Control has significant effect on trust beliefs	- 0.038	0.586	Not Supported

The results of hypothesis testing in Table 4.19 show that information privacy concern plays an important role in supporting the impact of control on trust beliefs. Thus, the hypothesis is accepted and the type of the mediation here is complete mediation since the direct effect is no longer significant after mediator enters the model.

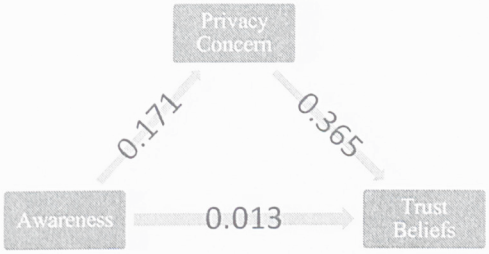

FIGURE 4.13: The Mediation Test of Awareness on Trust Beliefs

The indirect effect = 0.171* 0.365 = 0.624

The direct effect = 0.013

Since indirect effect > Direct effect, the mediation occurs type of the mediation here is complete mediation since the Direct effect is not significant after mediator the model shown in Figure 4.13.

The main hypothesis statement for testing a mediator: (H25): Information Privacy Concern of Cloud Based-E-Learning mediates the relationship between Awareness and Trust Beliefs.

TABLE 4.20: The Result of Mediation Test of Awareness on Trust Beliefs

Hypothesis Statement of Path Analysis 3 Sub- Hypothesis	Estimate	P-Value	Results
Awareness has significant effect on information privacy concerns	0.171	0.005	Supported
Information privacy concerns has significant effect on trust beliefs	- 0.365	0.000	Supported
Awareness has significant effect on trust beliefs	- 0.013	0.842	Not Supported

The results of hypothesis testing in Table 4.20 show that information privacy concern plays an important role in supporting the impact of awareness on trust beliefs. Thus, the hypothesis is accepted and the type of the mediation here is complete mediation since the direct effect is no longer significant after mediator enters the model.

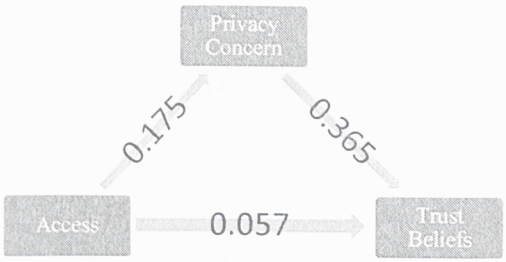

FIGURE 4.14: The Mediation Test of Access on Trust Beliefs

The indirect effect = 0.175* 0.365 = 0.0638

The direct effect = 0.057

Since indirect effect > Direct effect, the mediation occurs type of the mediation here is complete mediation since the Direct effect is not significant after mediator the model as shown in Figure 4.14.

The main hypothesis statement for testing a mediator: (H26): Information Privacy Concern of Cloud Based-E-Learning mediates the relationship between Access and Trust Beliefs.

TABLE 4.21: The Result of Mediation Test of Access on Trust Beliefs

Hypothesis Statement of Path Analysis 3 Sub-Hypothesis	Estimate	P-Value	Results
Access has significant effect on information privacy concerns	0.175	0.003	Supported
Information privacy concerns has significant effect on trust beliefs	- 0.365	0.000	Supported
Access has significant effect on trust beliefs	- 0.057	0.367	Not Supported

The results of hypothesis testing in Table 4.21 show that information privacy concern plays an important role in supporting the impact of access on trust beliefs. Thus, the hypothesis is accepted and the type of the mediation here is complete mediation since the direct effect is no longer significant after mediator enters the model.

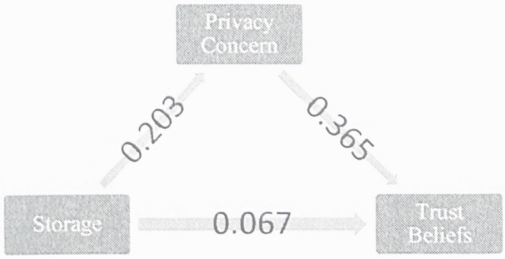

FIGURE 4.15: The Mediation Test of Storage on Trust Beliefs

The indirect effect = 0.203* 0.365 = 0.074

The direct effect = 0.067

Since indirect effect > Direct effect, the mediation occurs type of the mediation here is complete mediation since the Direct effect is not significant after mediator the model as showed in Figure 4.15.

The main hypothesis statement for testing a mediator: (H27): Information Privacy Concern of Cloud Based-E-Learning mediates the relationship between Storage and Trust Beliefs.

TABLE 4.22: The Result of Mediation Test of Storage on Trust Beliefs

Hypothesis Statement of Path Analysis 3 Sub- Hypothesis	Estimate	P-Value	Results
Storage has significant effect on information privacy concerns	0.203	0.000	Supported
Information privacy concerns has significant effect on trust beliefs	- 0.365	0.000	Supported
Storage has significant effect on trust beliefs	- 0.067	0.291	Not Supported

The results of hypothesis testing in Table 4.22 show that information privacy concern plays an important role in supporting the impact of storage on trust beliefs. Thus, the hypothesis is accepted and the type of the mediation here is complete mediation since the direct effect is no longer significant after mediator enters the model.

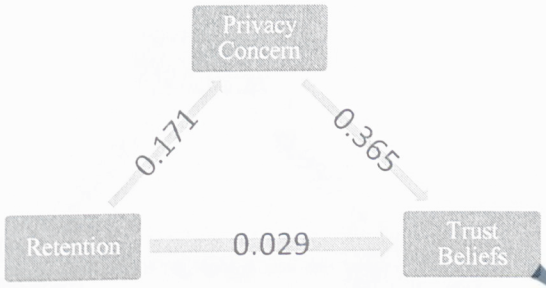

FIGURE 4.16: The Mediation Test of Retention on Trust Beliefs

The indirect effect = 0.171* 0.365 = 0.0624

The direct effect = 0.029

Since indirect effect > Direct effect, the mediation occurs type of the mediation here is complete mediation since the Direct effect is not significant after mediator the model as showed in Figure 4.16.

The main hypothesis statement for testing a mediator: (H28): Information Privacy Concern of Cloud Based-E-Learning mediates the relationship between Retention and Trust Beliefs.

TABLE 4.23: The Result of Mediation Test of Retention on Trust Beliefs

Hypothesis Statement of Path Analysis 3 Sub- Hypothesis	Estimate	P-Value	Results
Retention has significant effect on information privacy concerns	0.171	0.008	Supported
Information privacy concerns has significant effect on trust beliefs	- 0.365	0.000	Supported
Retention has significant effect on trust beliefs	- 0.029	0.679	Not Supported

The results of hypothesis testing in Table 4.23 show that information privacy concern plays an important role in supporting the impact of retention on trust beliefs. Thus, the hypothesis is accepted and the type of the mediation here is complete mediation since the direct effect is no longer significant after mediator enters the model.

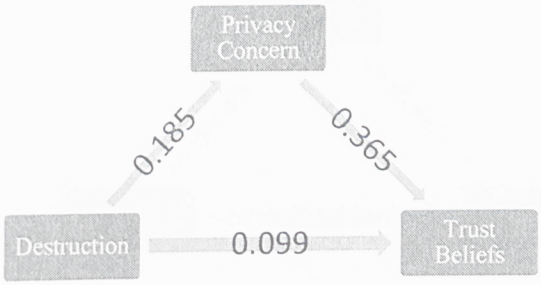

FIGURE 4.17: The Mediation Test of Destruction on Trust Beliefs

The indirect effect = 0.185 * 0.365 = 0.0676

The direct effect = 0.099

Since indirect effect < Direct effect, the mediation does not occurs as showed in Figure 4.17.

The main hypothesis statement for testing a mediator: (H29): Information Privacy Concern of Cloud Based-E-Learning mediates the relationship between Destruction and Trust Beliefs.

TABLE 4.24: The Result of Mediation Test of Destruction on Trust Beliefs

Hypothesis Statement of Path Analysis 3 Sub- Hypothesis	Estimate	P-Value	Results
Destruction has significant effect on information privacy concerns	0.185	0.007	Supported
Information privacy concerns has significant effect on trust beliefs	- 0.36	0.000	Supported
Destruction has significant effect on trust beliefs	- 0.099	0.172	Not Supported

The results of hypothesis testing in Table 4.24 indicate that information privacy concern does not mediate the relationship between destruction and trust beliefs. Thus, the hypothesis is rejected.

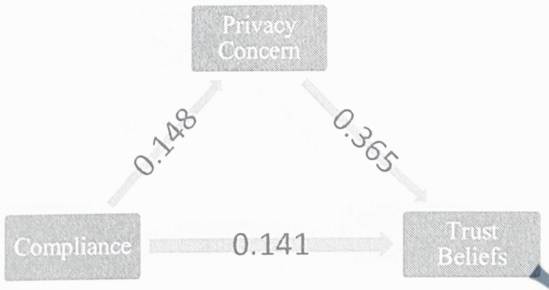

FIGURE 4.18: The Mediation Test of Compliance on Trust Beliefs

The indirect effect = 0.148* 0.365 = 0.053

The direct effect = 0.141

Since indirect effect < Direct effect, the mediation does not occurs as shown in Figure 4.18.

The main hypothesis statement for testing a mediator: (H30): Information Privacy Concern of Cloud Based-E-Learning mediates the relationship between Compliance and Trust Beliefs.

TABLE 4.25: The Result of Mediation Test of Compliance on Trust Beliefs

Hypothesis Statement of Path Analysis 3 Sub- Hypothesis	Estimate	P-Value	Results
Compliance has significant effect on information privacy concerns	0.148	0.007	Supported
Information privacy concerns has significant effect on trust beliefs	- 0.365	0.000	Supported
Compliance has significant effect on trust beliefs	- 0.141	0.016	Supported

The results of hypothesis testing in Table 4.25 indicate that information privacy concern does not mediate the relationship between compliance and trust beliefs. Thus, the hypothesis is rejected.

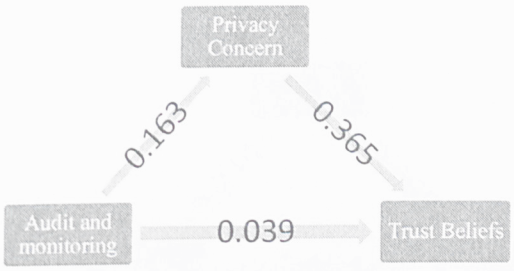

FIGURE 4.19: The Mediation Test of Audit and Monitoring on Trust Beliefs

The indirect effect = 0.163* 0.365 = 0.0594

The direct effect = 0.039

Since indirect effect > Direct effect, the mediation occurs type of the mediation here is a complete mediation since the Direct effect is not significant after mediating the model as shown in Figure 4.19.

The main hypothesis statement for testing a mediator: (H31): Information Privacy Concern of Cloud Based-E-Learning mediates the relationship between Audit and Monitoring and Trust Beliefs.

TABLE 4.26: The Result of Mediation Test of Audit and Monitoring on Trust Beliefs

Hypothesis Statement of Path Analysis 3 Sub- Hypothesis	Estimate	P-Value	Results
Audit and monitoring has significant effect on information privacy concerns	0.163	0.014	Supported
Information privacy concerns has significant effect on trust beliefs	- 0.365	0.000	Supported
Audit and monitoring has significant effect on trust beliefs	- 0.039	0.577	Not Supported

The results of hypothesis testing in Table 4.26 show that information privacy concern plays an important role in supporting the impact of audit and monitoring on trust beliefs. Thus, the hypothesis is accepted and the type of the mediation here is a complete mediation since the direct effect is no longer significant after the mediator enters the model.

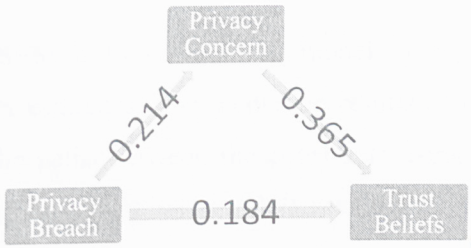

FIGURE 4.20: The Mediation Test of Information Privacy Breaches on Trust Beliefs

The indirect effect = 0.214 * 0.365 = 0.078

The direct effect = 0.184

Since indirect effect < Direct effect, the mediation does not occurs as shown in Figure 4.20.

The main hypothesis statement for testing a mediator: (H22): Information Privacy Concern of Cloud Based-E-Learning mediates the relationship between Information Privacy Breach and Trust Beliefs

TABLE 4.27: The Result of Mediation Test of Information Privacy Breaches on Trust Beliefs

Hypothesis Statement of Path Analysis 3 Sub- Hypothesis	Estimate	P-Value	Results
Information privacy breaches has significant effect on information privacy concerns	0.185	0.007	Supported
Information privacy concerns has significant effect on trust beliefs	- 0.365	0.000	Supported
Information privacy breaches has significant effect on trust beliefs	- 0.184	0.024	Supported

The results of the hypothesis testing in Table 4.27 indicate that information privacy concern does not mediate the relationship between information privacy breaches and trust beliefs, thus, the hypothesis is rejected.

4.4.11. Confirming the Results Through Bootstrapping

The final step in SEM is to validate the model by repeating the study using bootstrapping the parameter estimates. The mediation results of the structural model are confirmed by estimating the paths between the constructs using bootstrapping. In this research, the bootstrapping procedure using 1000 resample is carried out using. The results of bootstrapping are as following.

4.4.11.1. Bootstrapping Results of Mediation Test on Risk Beliefs

TABLE 4.28: The Bootstrapping Results for Control on Risk Beliefs

	Indirect Effects	**Direct Effects**
Bootstrapping result	0.004	0.739
Bootstrapping P value	0.004	0.732
Result	Significant	Not significant
Type of mediation	**Full mediation** since Direct Effects Not significant	

Based on the results of Table 4.28, the researcher can conclude that the result of bootstrapping is consistent with the results of mediation test in Table 4.10.

TABLE 4.29: The Bootstrapping Results for Awareness on Risk Beliefs

	Indirect Effects	**Direct Effects**
Bootstrapping result	0.016	0.526
Bootstrapping P value	0.015	0.539
Result	Significant	Not significant
Type of mediation	**Full mediation** since Direct Effects Not significant	

Based on the results of Table 4.29, the researcher can conclude that the result of bootstrapping is consistent with the results of mediation test in Table 4.11.

TABLE 4.30: The Bootstrapping Results for Storage on Risk Beliefs

	Indirect Effects	**Direct Effects**
Bootstrapping result	0.005	0.408
Bootstrapping P value	0.004	0.437
Result	Significant	Not significant
Type of mediation	**Full mediation** since Direct Effects Not significant	

Based on the results of Table 4.30, the researcher can conclude that the result of bootstrapping is consistent with the results of mediation test in Table 4.13.

TABLE 4.31: The bootstrapping results for Retention on Risk Beliefs

	Indirect Effects	**Direct Effects**
Bootstrapping result	0.034	0.734
Bootstrapping P value	0.031	0.753
Result	Significant	Not significant
Type of mediation	**Full mediation** since Direct Effects Not significant	

Based on the results of Table 4.31, the researcher can conclude that the result of bootstrapping is consistent with the results of mediation test in Table 4.14.

TABLE 4.32: The Bootstrapping Results for Compliance on Risk Beliefs

	Indirect Effects	**Direct Effects**
Bootstrapping result	0.02	0.425
Bootstrapping P value	0.01	0.44
Result	Significant	Not significant
Type of mediation	**Full mediation** since Direct Effects Not significant	

Based on the results of Table 4.32, the researcher can conclude that the result of bootstrapping is consistent with the results of mediation test in Table 4.16.

TABLE 4.33: The Bootstrapping Results for Audit and Monitoring on Risk Beliefs

	Indirect Effects	**Direct Effects**
Bootstrapping result	0.019	0.685
Bootstrapping P value	0.017	0.685
Result	Significant	Not significant
Type of mediation	**Full mediation** since Direct Effects Not significant	

Based on the results of Table 4.33, the researcher can conclude that the result of bootstrapping is consistent with the results of mediation test in Table 4.17.

4.4.11.2. Bootstrapping Results of Mediation Test on Trust Beliefs

TABLE 4.34: The Bootstrapping Results for Control on Trust Beliefs

	Indirect Effects	**Direct Effects**
Bootstrapping result	0.002	0.64
Bootstrapping P value	0.003	0.643
Result	Significant	Not significant
Type of mediation	**Full mediation** since Direct Effects Not significant	

Based on the results of Table 4.34, the researcher can conclude that the result of bootstrapping is consistent with the results of mediation test in Table 4.19.

TABLE 4.35: The Bootstrapping Results for Awareness on Trust Beliefs

	Indirect Effects	**Direct Effects**
Bootstrapping result	0.015	0.919
Bootstrapping P value	0.014	0.923
Result	Significant	Not significant
Type of mediation	**Full mediation** since Direct Effects Not significant	

Based on the results of Table 4.35, the researcher can conclude that the result of bootstrapping is consistent with the results of mediation test in Table 4.20.

TABLE 4.36: The Bootstrapping Results for Access on Trust Beliefs

	Indirect Effects	**Direct Effects**
Bootstrapping result	0.007	0.47
Bootstrapping P value	0.008	0.47
Result	Significant	Not significant
Type of mediation	**Full mediation** since Direct Effects Not significant	

Based on the results of Table 4.36, the researcher can conclude that the result of bootstrapping is consistent with the results of mediation test in Table 4.21.

TABLE 5.37: The Bootstrapping Results for Storage on Trust Beliefs

	Indirect Effects	**Direct Effects**
Bootstrapping result	0.001	0.409
Bootstrapping P value	0.001	0.409
Result	Significant	Not Significant
Type of mediation	**Full mediation** since Direct Effects Not significant	

Based on the results of Table 4.37, the researcher can conclude that the result of bootstrapping is consistent with the results of mediation test in Table 4.22.

TABLE 4.38: The Bootstrapping Results for Retention on Trust Beliefs

	Indirect Effects	**Direct Effects**
Bootstrapping result	0.047	0.756
Bootstrapping P value	0.047	0.76
Result	Significant	Not significant
Type of mediation	**Full mediation** since Direct Effects Not significant	

Based on the results of Table 4.38, the researcher can conclude that the result of bootstrapping is consistent with the results of mediation test in Table 4.23.

TABLE 4.39: The Bootstrapping Results for Audit and Monitoring on Trust Beliefs

	Indirect Effects	**Direct Effects**
Bootstrapping result	0.022	0.738
Bootstrapping P value	0.022	0.723
Result	Significant	Not significant
Type of mediation	**Full mediation** since Direct Effects Not significant	

Based on the results of Table 4.39, the researcher can conclude that the result of bootstrapping is consistent with the results of mediation test in Table 4.26.

4.4.12. The Model Fits

To evaluate the developed framework, the coefficient parameter estimates are examined along with the goodness-of-fit indices to assess if the hypothesized structural model fits the data. The model is defined by 38 items that identified the eleven factors. The results obtained for goodness-of-fit statistics indicate the overall acceptability of the structural model analyzed. The covariance matrix among the variables is used to test the model. The goodness-of-fit indices show that this model fits the data adequately, The CFI = 0.943, TLI = 0.934, RSMEA = 0.068, $\chi 2$ /df = 2.002.

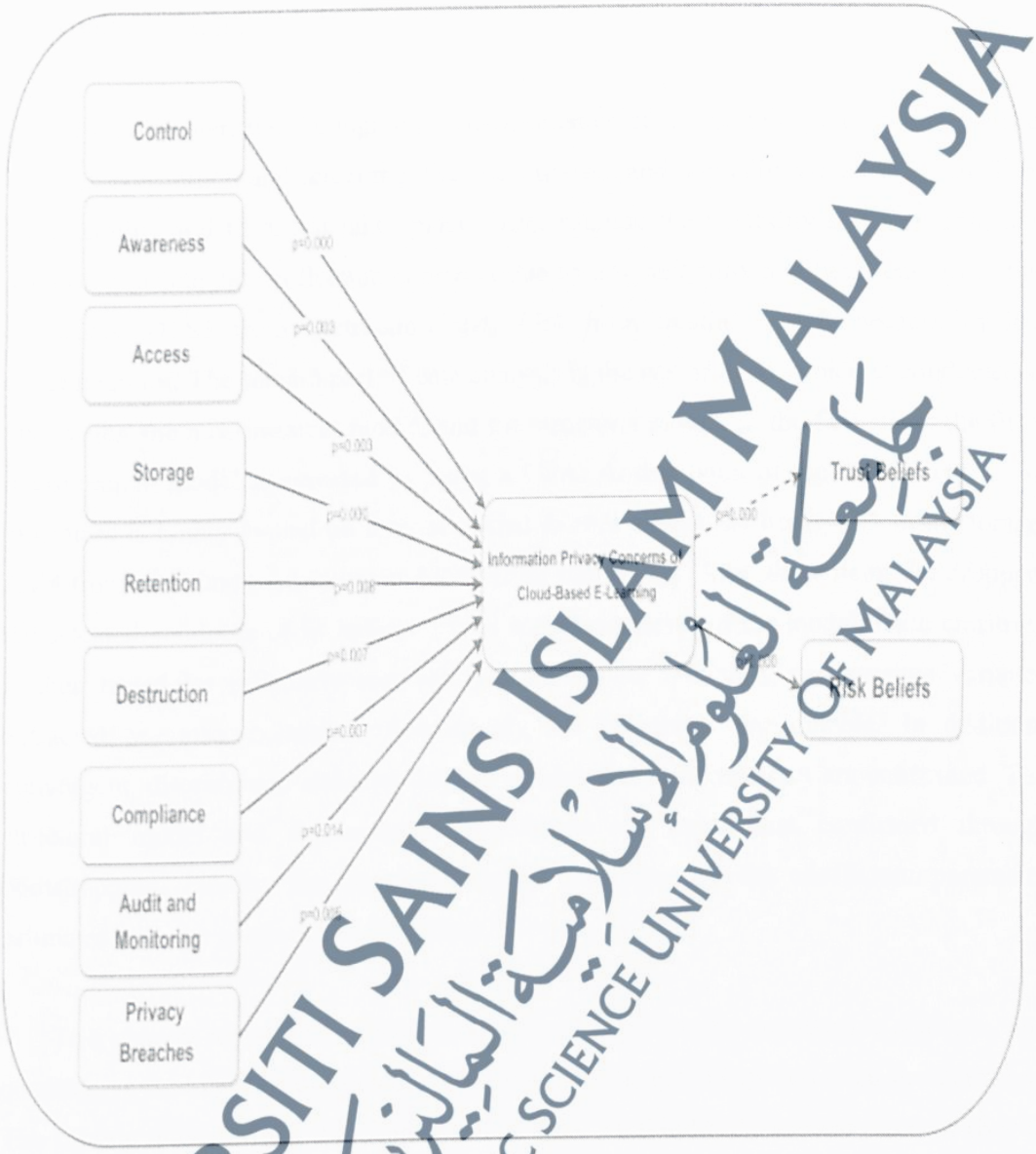

FIGURE 4.21: The Hypotheses Result of Information Privacy Framework for Cloud Based E-Learning Users

4.5. Chapter Summary

In this chapter, the demographic characteristics of the sample have been described. For data preparation and screening, the missing data, and normality were examined. Then the reliability and EFA test takes place. After running the reliability and EFA test, it is decided to delete data collection construct due to low reliability and two items from two constructs: DES3 from destruction and, TB4 from trusting beliefs because of low communalities. The second part of data analysis is the use of SEM, which is conducted in two stages, the measurement model, and the structural model. In the first stage, the fit of measurement model is assessed by using a CFA. At this point of the assessment, of all indicators is highly loaded on their specified factors except the items ST3 from storage, AM4 from audit and monitoring and RB1 from risk beliefs. After these items are dropped, the selected goodness-of-fit indices are on acceptance level of the model. Each construct is then tested for reliability and validity. Composite reliability and average variance extracted are also examined. Accordingly, all constructs are reliable. In addition, convergent, discriminant and nomological validity for each construct are confirmed. The structural model and the research hypotheses are tested and confirmed through bootstrapping. Finally, the structural models evaluated by the coefficient parameter estimates with the goodness-of-fit indices.

This chapter reports the results of the data analysis for the quantitative analysis. The quantitative findings are presented around the main themes identified from the literature. The finding indicates that the control (β = 0. 255, p= 0.000), Awareness, Access (β = 0. 175, p= 0.003), Storage (β = 0. 203, p= 0.000), Retention (β=0.171, p=0.008), Destruction (β = 0. 185, p= 0.007), Compliance (β = 0.148, p= 0.007), Audit and Monitoring (β=0.163, p<0.014), Information Privacy Breaches (β=0.171, p=0.008) all have a positive effect on information privacy concerns of loud-based e-learning. Besides, Information Privacy Concern has a positive effect on Risk Beliefs (β=0.36, p=0.000) and negative effect on Trust Beliefs (β= - 0.365, p<0.000). Further, the study finds out that an information privacy concern has a mediating relationship between these factors and trust and risk beliefs. Generally, support is given to the conceptual framework presented in

chapter two. The results of the significant relationships between constructs are as theoretically expected. However, more detailed discussion of the findings and research framework will be provided in next chapter.