Journal of Education and Practice
ISSN 2222-1735 (Paper) ISSN 2222-288X (Online)
Vol.14, No.15, 2023

Perception, Personal Issues, and Environment of E-Learning: A Causal Model on Student Attitude Towards Online Learning

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Abstract
This study determined the best-fit model for attitude towards online learning of grade 12 students in Region XI based on perception on e-learning, personal issues on e-learning, and the environment of e-learning. This study employed a causal study design and a stratified sampling technique in selecting the 400 respondents. With the electronic survey facility through Google Forms, data were collected utilizing standardized adapted questionnaires. The study utilized the mean, standard deviation, Pearson's product-moment correlation, regression analysis, and structural equation model as statistical tools. Results revealed that the level of student perception on e-learning was high; the level of their personal issues on e-learning was high; the level of e-learning environment was high; and the level of attitude towards online learning was high. Moreover, a significant relationship existed between the exogenous and endogenous variables. Furthermore, perception on e-learning, personal issues on e-learning, and the e-learning environment influence the attitude towards online learning. Finally, among the five generated models, Model 5 best-fitted student attitude towards online learning in terms of interest in computers and adoption of online learning and ease-ness in using online learning, with perception on e-learning in terms of perceived usefulness of e-learning and perceived self-efficacy of using e-learning; personal issues on e-learning in terms of health, conflict resolution, and motivation; and environment of e-learning in terms of ethics and professionalism, and program effectiveness.
Keywords: educational management, perception on e-learning, personal issues on e-learning, e-learning environment, attitude towards online learning, structural equation model, Philippines
DOI: 10.7176/JEP/14-15-08
Publication date: May 31st 2023

1. Introduction

The limitations imposed by the recent pandemic have thrown the inflexibility of the Filipino educational system into stark contrast. With this in mind, it is vital that serious attention is given to alleviating or eliminating this inflexibility to avoid future hindrances and detriments to national education. To this end, this research focuses on attitudes towards online learning. This particular variable encompasses all objective and subjective views of students regarding their perspective on e-learning's efficacy, ease of use, and overall interest in this particular educational system (Ullah, 2018; Barman *et al.,* 2021).

This study, in particular, focuses on the implications of the various variables affecting one's attitude towards online learning as it is the fulcrum of the national e-learning program adopted during the period when restrictions were being enforced throughout the Philippines. Various studies during that time made locally and abroad highlighted the importance of improving on it as it would determine the quality and continuity of an entire generation's students moving forward (Inan, 2021; Mustari, 2022; Ozdamli & Karagozlu, 2022; Tea, 2022;). This study aims to provide a detailed outlook on this issue as it presents itself locally.

Furthermore, several independent variables were chosen to account for those, as mentioned earlier, internal and external factors that could affect a student's attitude toward e-learning. First among these is their perception on e-learning. Their many biases and personal preferences color a student's perception. This, in turn, represents the subjective and internal factor that drives a student's attitude toward e-learning and is represented by the following three indicators: perceived usefulness of e-learning, perceived self-efficacy of using e-learning, and behavioral intention of using e-learning (Khan *et al.,* 2021).

Naturally, all three are purely subjective. This indicator, as mentioned, represents the personal subjective factor that affects a student's attitude to e-learning. Perceived usefulness can be anything from a subjective sense of efficacy to abstract concepts of success and accomplishment. On the other hand, perceived self-efficacy relates to one's sense of integration and compatibility with the methodology used. Lastly, behavioral intent is the internal motivation for using such technology, whether in favor of or a detriment to the act of learning (Saragih et al., 2019; Leonardo & Cha, 2021; Rajeh *et al.,* 2021).

Likewise, Personal Issues on e-learning can be seen as a defining variable affecting a student's attitude toward e-learning. These issues represent internal and external factors that influence student perception of e-

learning and are represented by the following five indicators: motivation, self-esteem, personal relationships, conflict resolution, and health (Ellis, 1994; 1998). This particular variable focuses on the environmental stimuli that affect a student's decision-making and is also the one variable dealing with the effect of other people's actions on student perception.

Additionally, the indicators representing this variable also pertain to environmental and socio-cultural factors influencing a student's state of mind, with motivation and self-esteem being good examples. Students' personal relationships and conflict resolution skills also come into play, especially when these relationships are with people they respect, fear, or idolize. Lastly, their very own health can impact their perceptions then. Students can make considerations at any time that are influenced by the above factors that can affect their attitude toward e-learning (Iwasaki *et al.,* 2019; Phutela & Dwivedi, 2020; Ninsiana *et al.,* 2022).

Lastly, there is the e-learning environment itself. As a variable assessing students' attitudes towards e-learning, it is the most visceral, as it is the most starkly differentiating aspect of the entire e-learning system (El-Sabagh, 2021). The e-learning environment, as the name implies, is a virtual space for learning maintained and accessed through an online network. Its primary difference from traditional learning environments is that it is remote, and this same quality highlights its weaknesses and strengths the most (Herrador-Alcaide *et al.,* 2020; Yunusa & Umar, 2021).

Likewise, it is also represented by five of its indicators - namely: program effectiveness, teaching quality, ethics and professionalism, learner support, safety and convenience, and awareness of the rules (Mousavi *et al.,* 2020). These indicators represent the outward or external factors that students perceive from either their teacher or their school regarding the quality of e-learning. Program effectiveness and teaching quality are tied directly to teacher performance, while ethics and professionalism represent the professional attitude shown by these teachers. Learner support, safety and convenience, and awareness of the rules are likewise student-centered services that have come to be limited in access due to the nature of the e-learning system (Valantinaitė, 2020).

Research in which perception, personal issues, e-learning environment, and student attitude towards online learning are scrutinized concurrently within a shared context and the confines of the Philippine educational system still requires many contributions considering its ever-growing scope. Past research demonstrated linear effects on students' perceptions, attitudes, and readiness toward online learning (Linjawi & Alfadda, 2018). A recent study reported that students possessed negative attitudes towards online learning during the COVID-19 PANDEMIC (Liu *et al.,* 2022).

However, there is no study on perception, personal issues, and environment of e-learning: a causal model on student attitude towards online learning. Hence, this study seeks to fill this research gap by determining the structural equation model on attitude towards online learning of grade 12 students in Region XI, Philippines. The findings from this research will be significant as they will provide insights into how local conditions affect this variable and the various options open to administrators, teaching professionals, institutions, and students to address this issue.

This study aims to determine a predictive model of Grade 12 students' attitudes toward online learning in Region XI. This study dealt with the following objectives: First, to describe the level of perception on e-learning in terms of perceived usefulness of e-learning, perceived self-efficacy of using e-learning, and behavioral intention of using e-learning. Second, to evaluate the level of personal issues on e-learning in terms of motivation, self-esteem, personal relationships, conflict resolution, and health. Third, to find out the level of the e-learning environment in terms of program effectiveness, teaching quality, ethics and professionalism, learner support, safety and convenience, and awareness of the rules.

Fourth, to assess the level of attitude towards online learning in terms of interest in computers and adoption of online learning, the effectiveness of online learning, and ease-ness of using online learning. Fifth, to determine the significant relationship between perception on e-learning and attitude towards online learning, personal issues on e-learning and attitude towards online learning, and e-learning environment and attitude towards online learning. Sixth, to determine which variable best influences the attitude towards online learning. Seventh, to determine which model best fits the attitude towards online learning.

In addition, the following null hypotheses will be tested at a 0.05 level of significance: First, there is no significant relationship between perception on e-learning and attitude towards online learning; between personal issues on e-learning and attitude towards online learning; and between e-learning environment and attitude towards online learning. Second, there is no model that best fits attitude towards online learning.

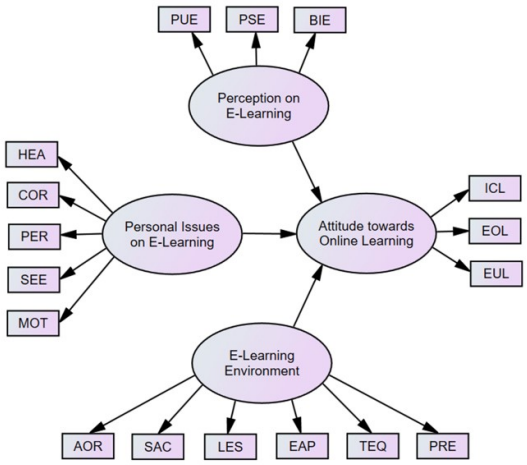

Figure 1: Conceptual Framework of the Study

PUE	- Perceived Usefulness of E-Learning	SAC	- Safety and Convenience
PSE	- Perceived Self-Efficacy of Using E-Learning	LES	- Learner Support
BIE	- Behavioral Intention of Using E-Learning	EAP	- Ethics and Professionalism
HEA	- Health	TEQ	- Teaching Quality
COR	- Conflict Resolution	PRE	- Program Effectiveness
PER	- Personal Relationships	ICL	- Interest in Computers and Adoption of Online Learning
SEE	- Self-Esteem		
MOT	- Motivation	EOL	- Effectiveness of Online Learning
AOR	- Awareness of the Rules	EUL	- Ease-ness in Using Online Learning

The E-Learning Theory by David (2015) was chosen as the primary anchor for this research. The E-Learning Theory emphasizes and expands on a concept known as cognitive load, which means that the memory and attention of students are finite, which necessitates the prioritization and organization of information that passes through their minds during education. This theory was chosen primarily due to the nature of e-learning in general, which allows access to a large amount of information at any given time. Without proper moderation, the theory states that such a system may damage the student's development instead of aiding it.

Several supporting theories and models will be used as additional support in order to tie in the various independent variables to the primary dependent variable. One of these is Bryant et al.'s (2013) Behaviorist Learning Theory. This theory expands the link between students' perception of e-learning to their attitude toward e-learning. This theory focuses on the effects of one's environment on their subjective perceptions. Considering the stark difference between e-learning and traditional learning environments, the very perception of a student in their learning environment could primarily affect their perception and, by extension, their attitude towards e-learning.

Next, in connecting Personal Issues on e-learning to a student's attitude towards e-learning, Lyon's (1971) Humanistic Theory of Learning was used. The Humanistic Theory of Learning emphasizes motivation and personal drive, which is variably affected in students according to their present state of mind. This state of mind is, in turn, influenced by the environmental factors brought about by their issues and how they are handled. Likewise, these ecological factors can be affected by one's attitude, and in this case, they can also refer to students' attitudes toward e-learning (Baumann & Harvey, 2018).

Finally, the Cognitive Load Theory (Sweller *et al.,* 2019) connected the e-learning environment to a student's attitude toward online learning. Sweller *et al.* theorized that student motivation, perception, and efficiency in learning are directly tied to how valuable information is presented. They posited that the human mind can only handle a certain amount of information and that pacing is the key to efficient learning. This contrasts with an e-learning environment where information is readily available and can be presented in volumes much more significant than what can reasonably be handled.

The exogenous variables of this study are perception on e-learning, personal issues on e-learning, and the e-learning environment. On the other hand, the endogenous variable is the attitude towards online learning. Since latent variables are not observed directly, they cannot be measured directly. Each latent construct was associated with multiple measures or observed variables. Thus, the extent of regression paths from the latent variable to the observed variables will be one of the primary interests of this study.

The latent perception on e-learning has three indicators: perceived usefulness of e-learning, perceived self-efficacy of e-learning, and behavioral intention of using e-learning. Perceived usefulness of e-learning is the perception of the purpose of e-learning; perceived self-efficacy of using e-learning is the perception of e-learning's effectiveness as well as the student's performance; and behavioral intention of using e-learning denotes the purpose laid out by both student and teacher when utilizing e-learning as a tool (Khan *et al.,* 2021).

The latent personal issues have five indicators: motivation, self-esteem, personal relationships, conflict resolution, and health. Motivation refers to one's emotional push, whether extrinsic or intrinsic, to perform a specific action; self-esteem is one's perception of worth and confidence; personal relationships is a blanket term that includes one's connections between others outside of oneself; conflict resolution refers to one's ability to resolve issues and conflicts in either a positive or negative manner; and health guides to one's emotional, physical, and mental stability in the face of everyday stress (Ellis, 1994; 1998).

The latent e-learning environment consists of six indicators: program effectiveness, teaching quality, ethics and professionalism, learner support, safety and convenience, and awareness of the rules. The program denotes the specific set of goals in place that will act as the main focus of education; teaching quality which refers to the overall quality of teaching methodology, proficiency, and technique; ethics and professionalism, which refers to both moral and professional demeanor; learner support which refers to the third-party support offered by a school's auxiliary services; safety and convenience which refers to the subjective and objective sense of efficiency and security; and awareness of the rules which represents acquired knowledge of the administrative functions and obligations tied to the application of e-learning technology (Mousavi *et al.,* 2020).

Attitude towards online learning has three indicators: interest in computers and adoption of online learning, the effectiveness of online learning, and ease-ness of using online learning. Interest in computers and adoption of online learning represents prior exposure to and adapted uses of computerized technology; effectiveness of online learning refers to the efficacy and efficiency of online learning as a learning and teaching tool; and ease-ness in using online learning denotes the minimum required skill to be considered proficient in the use of online learning platforms for education (Ullah, 2018).

This study, like many before it, was made in response to the global pandemic and sought to provide the means and the information by which education can progress and improve despite the constraints and limitations it must endure during these trying times. The present literature hopes to expand and specify critical points regarding the various factors affecting students' attitudes toward online learning. With time, the information gleaned from this study may catalyze the wide-scale integration of technology and remote learning concepts for improving education worldwide.

Naturally, the research aims to provide information and insight essential to improving the educational system of the Philippines as a whole. Though applicable to other countries and cultures, the information will be specifically targeted toward the parties most concerned by a steady progression, adaptation, and implementation of online learning.

Educational institutions will be provided with the relevant information by which they may plan and implement future projects or adaptations of the suggested model for online learning. In addition, interventions on the state of staff and student affairs will no doubt be streamlined once appropriate considerations outlined within this study have been considered.

Institutional administrators can bypass much of the brainstorming required to implement, maintain, and improve online learning systems. This can include staff training, infrastructure, and remote management of staff, students, and resources.

On the other hand, teaching professionals can use this study as their basis for self-improvement and adaptation. Considering the significant disparity of expectations and interactivity between traditional and online classroom dynamics, it will no doubt save them time and effort that would otherwise have been used to conduct their trial-and-error attempts.

For students, as it concerns them directly, this study will no doubt contribute to an increase in the quality of remote learning - not only for this generation coming out of the pandemic's restrictions but all those who will come after under the restrictions of a similar event or a simple option for remote learning.

Lastly, future researchers can build upon the conclusions within this study and conduct something far more in-depth and encompassing than the limitations stated here. This avenue of study is by no means a dead-end, and there is still much room for improvement. The researcher hopes this research will prove helpful for future generations looking to highlight the potential of remote learning as an alternative to more traditional means of education.

2. Method

2.1 Research Respondents

The sample population involved in this study included 400 students, including a select number of Grade-12 students from 11 congressional districts located within Region XI of the Philippines archipelago. These students were chosen from a total of 57,031 (see Appendix K) who were deemed eligible candidates for the Academic Year 2021-22 from the eleven school divisions listed as follows: Davao De Oro (76), Davao Del Norte (49), Davao Del Sur (33), Davao Occidental (24), Davao Oriental (38), Davao City (108), Digos City (6), Mati City (12), Panabo City (19), IGACOS (12), and Tagum City (23).

Using the sample size calculator by Raosoft, Inc. (1996-2011), when the margin of error is 5%, the confidence level is 95%, the response distribution is 50%, and the population size is 57,031, the recommended sample size is 382. Another sample calculator by Creative Research Systems (2022) determines the same sample size, which is 382. On the other hand, using the Yamane sample size calculator (OY Calculator, 2022), the recommended number of respondents is 397. Therefore, a total of 400 respondents is the bare minimum to conduct the study with acceptable accuracy.

Each participant was chosen according to the principles of Stratified Random Sampling. This sampling technique separates the population sample into groups based on shared characteristics and behaviors. In this research, the Stratified Sampling Technique was favored due to its robustness in the selection and the higher precision it provided compared to traditional random sampling (Parsons, 2017).

The 400 respondents of the study were chosen using a value of ten for the per strata quota sampling, which is the most appropriate for the Structural Equation Modeling used. This value of 10 per subgroup sampled was done to avoid bias from affecting the results in any statistical significance (Deng et al., 2018). 11 divisions from Region XI of the Philippines were sampled individually to attain an adequate number for the purposes and limitations of the study. Since each participating school will inevitably show distinct differences in behavior and characteristics, separating them into discrete strata will allow relatively decent accuracy while maintaining ease of use (Parsons, 2017).

The respondents included all those presently enrolled in General Academic Strand (GAS), Humanities and Social Sciences (HUMSS), Science, Technology, Engineering, and Mathematics (STEM), Accountancy, Business, and Management (ABM), and Information and Communication Technology (ICT) within Region XI public high schools that have reached legal age (18+). The researcher deduced that they were the population most fit to be the study respondents due to their position and experience that hold relevance to the study's goals. Excluded groups include all grade 11 students and below, parents, school heads, and DepEd Officials. This study focused on the attitude towards online learning of Grade 12 students in public schools.

The respondents can be withdrawn from the research study if they commit falsification, plagiarism, and other moral offenses or if the respondents have health conditions and special needs. Participants can withdraw from the research study if they feel troubled or discomfited. The participants should let the researcher know that they wish to withdraw. Any participant wishing to withdraw from the survey retains the right to disclose their reasons and will not be pressured to provide a valid excuse.

The researcher conducted the study in Region XI, Philippines. This is being considered the venue of the study since the researcher resides within the region and would like to find out in a broader scope whether the perception on e-learning, personal issues on e-learning, and e-learning environment correlate with the attitude towards online learning of Grade 12 students.

Davao Region is located in the southeastern portion of Mindanao and comprises five provinces: Davao de Oro, Davao del Norte, Davao Oriental and Davao del Sur, and Davao Occidental. The region has six cities, namely: Davao, Digos, Mati, Panabo, Samal, and Tagum, and 43 municipalities, grouped into 11 congressional districts and divided into 1,162 barangays.

The region serves as a melting pot of many cultural groups. Cebuanos, Boholanos, and Ilonggos are the majority groups. Others include Maguindanaos, Maranaos, Manobos, T'bolis, Bagobos, B'laans, Samals, and Agtas. Smaller communities of Ilocanos, Tagalogs, Warays, and Bicolanos have also settled here. There are 303 public secondary schools within the region, as the survey revealed in 2016, and among these schools, the study was implemented (Regional Profile, 2022).

2.2 Materials and Instrument

This study adapted downloaded questionnaires from web sources. The questionnaires were modified to incorporate only the items relevant to the study. The draft was presented to the researcher's adviser for comments and annotations. The researcher requested experts to validate the questionnaire and got an average rating of 4.36 which means very good.

After validation, the consistency of the questionnaires was tested through pilot testing. It was articulated by Al-Osail *et al.* (2015) that Cronbach's alpha reliability coefficient typically ranges between 0 and 1. However, there is no lower limit to the coefficient. The closer Cronbach's alpha coefficient is to 1.0, the

greater the internal consistency of the items in the scale.

The questionnaire consisted of variables such as perception on e-learning, personal issues on e-learning, e-learning environment, and attitude towards online learning. There are four instruments in this study, namely: Perception on E-Learning Scale, Personal Issues on E-Learning Scale, E-Learning Environment Scale, and Attitude towards Online Learning Scale.

Perception on E-Learning. Perception on E-Learning Scale (PES) was developed by Khan *et al.* (2021). This instrument consists of 10 items: four from the perceived usefulness of e-learning, three from the perceived self-efficacy of e-learning, and three from the behavioral intention of using e-learning. This was designed to provide a reliable way to assess the overall subjective response of the student to the concept and application of e-learning. During pilot testing, it was found to have had a reliability rating of 0.916 on the Cronbach-alpha, which represents an excellent reliability rating.

Personal Issues on E-Learning. The Personal Issues on E-learning Scale (PIS) was developed by Ellis (1994; 1998). The PIS comprises 25 items divided into five sub-scale: motivation, self-esteem, personal relationships, conflict resolution, and health. This is designed to help us better understand the presence and magnitude of personal issues that the various Grade 12 students display. During pilot testing, it was found to have had a reliability rating of 0.961 on the Cronbach-alpha, which represents an excellent reliability rating.

E-Learning Environment. Based on the E-Learning Environment Scale (EES) of Mousavi *et al.* (2020), this scale was designed to identify the factors that may influence the various influential variables that significantly alter a school's e-learning environment. The instrument contained factors related to the assessment and emphasis on the various factors related to the development and quality of a school's e-learning environment.

EES consists of a total of forty (40) items spread out across the six (6) subscales of program effectiveness (9 Items); teaching quality (8 Items); ethics and professionalism (7 Items); learner support (9 Items); safety and convenience (4 Items); and awareness of the rules (3 Items). During pilot testing, it was found to have had a reliability rating of 0.979 on the Cronbach-alpha, which represents an excellent reliability rating.

Attitude towards Online Learning. Attitude Towards Online Learning Scale (AOLS), developed by Ullah (2018), consists of 28 items subdivided into three subscales: seven items from the interest in computers and adoption of online learning, 11 items from the effectiveness of online learning, and ten items from ease-ness in using online learning. This scale determines students' overall impression and subsequent response regarding the practical application and formation of the e-learning environment. During pilot testing, it was found to have had a reliability rating of 0.960 on the Cronbach-alpha, which represents an excellent reliability rating.

A scale was used to evaluate the perception on e-learning, personal issues on e-learning, e-learning environment, and attitude towards online learning of Grade 12 students. A mean of 4.20 to 5.00 and a very high descriptive level imply that the indicators of perception on e-learning, personal issues on e-learning, e-learning environment, and attitude towards online learning are always observed; a mean of 3.40 to 4.19 and a high descriptive level imply that the indicators are oftentimes observed; a mean of 2.60 to 3.39 and a moderate descriptive level imply that the indicators are sometimes observed; a mean of 1.80 to 2.59 and a low descriptive level imply that the indicators are seldom observed. Moreover, a mean of 1.00 to 1.79 and a very low descriptive level imply that the indicators are never observed.

2.3 Design and Procedure

This study utilized a quantitative non-experimental research design through a descriptive-correlational technique. This method measures relations of variables with changeable levels of extent. It was emphasized by Canonizado (2021) that descriptive-correlation studies provided an understanding of what is in a particular condition with a recognized population and scrutinized the level to which two or more variables correlate.

In addition, a causal study design was employed. As noted by Abrahim et al. (2019), this technique coalesces factor examination with alleyway investigation to test conjectural associations among concealed variables. This replicates the range from simple to complex on any variables or types involved (i.e., observed, latent, independent, and dependent variables).

The amalgamation of regression and path analysis utilized compound procedures of each latent variable as an alternative to a specific measure; it facilitates improved quantity circumstances (i.e., reliability and validity) than with a special assessment. This process was used to quantify the liaison of attitude towards online learning between perception on e-learning, personal issues on e-learning, and the e-learning environment of Grade 12 students in Region XI.

All relevant documents necessary for the study were collected and submitted, including a permission letter signed by the researcher's adviser and the current Dean. Pilot testing commenced a week after submission, with the University of Mindanao Ethics Review Center (UMERC) Certificate of Approval secured. With the Research Instrument tested and validated, the researcher submitted the required documents

to the Department of Education Regional Director of Region XI.

Following the receipt of the Director's approval letter, the researcher personally visited each of the 11 DepEd Division Offices related to the study and duly requested their approval. With all the necessary paperwork accomplished, the researcher proceeded to each Division's related Senior High School section and began collecting data. While the limitations necessitated by the pandemic did complicate the dissemination and collection of the research instrument, it turned out to be much more convenient for the participants than initially expected. All the raw data was then organized into spreadsheets and submitted to an expert for statistical analysis. The specified time frame to conduct the study was on the third and fourth academic quarters of the School Year 2021-22, specifically from February 7, 2022, up to June 4, 2022 (Davao Region, 2021).

Data analysis proceeded using a descriptive and inferential approach and the Structural Equation Model. The statistical tools Frequency, Mean, and Standard Deviation was used to determine the measures of central tendency (Foster *et al.,* 2022) in assessing the levels of perception on e-learning, personal issues on e-learning, e-learning environment, and attitude towards online learning.

Pearson's Product-Moment Correlation was also used to determine whether the variables correlated positively or negatively (Lane, 2022). On the other hand, factor analysis and multiple regression analysis (Nguyen, 2020) were used to determine which exogenous variable best-influenced attitude toward online learning. The Structural Equation Model (Deng *et al.,* 2018) determined the best-fit model for attitude towards online learning.

In order to determine the best-fit model, the Goodness of fit Statistics for the Alternative Model thru Analysis of Moment Structures (AMOS) was utilized. All the values of the given indices must fall with each criterion: the P-value is greater than 0.05; the value of Chi-Square/Degree of Freedom is greater than 0 but less than 2; the Goodness of Fit Index (GFI) is greater than 0.95; Comparative Fit Index (CFI) is greater than 0.95; Normed Fit Index (NFI) is greater than 0.95; Tucker-Lewis Index is greater than 0.95; the value of Root Mean Square or Error Approximation (RMSEA) is less than 0.05; and the value of P-close is greater than 0.05 (Cucos, 2022).

Contingent to the University of Mindanao Ethics Review Center with protocol number UMERC-2022-038, the researcher observed and followed the strict ethical standards expected of an academic paper. This involves observance of voluntary participation, privacy and confidentiality, informed consent, and transparency while avoiding factors that may damage the integrity of the results, such as deceit, plagiarism, conflict of interest, falsification, and fabrication. All this was done to ensure that whatever result comes from this research solely depends on the reliability and integrity of the methodology presented and performed without outside interference or influence.

3. Result and Discussion

This section presents the results of the findings of the study. The first part describes the level of perception on e-learning, personal issues on e-learning, e-learning environment, and attitude towards online learning. The second part deals with the correlation between perception on e-learning, personal issues on e-learning, e-learning environment, and attitude towards online learning. The third part presents the best-fit model for the attitude towards online learning.

3.1 Perception on E-Learning

Shown in Table 1 is the level of perception on e-learning. The result is measured by three indicators: perceived usefulness of e-learning, perceived self-efficacy of using e-learning, and behavioral intention of using e-learning. The overall standard deviation of 0.64 is less than 1.00, meaning the students' responses were consistent. The overall mean of 3.68, which is high, indicates that the perception on e-learning of Grade 12 students is oftentimes observed. Among the three indicators, the behavioral intention of using e-learning obtained the highest mean of 3.84, which is described as high. This means that the perception of e-learning in terms of the behavioral intention of using e-learning is always observed.

The indicator perceived usefulness of e-learning has a mean of 3.78, which is described as high. This means that the perception on e-learning in terms of the perceived usefulness of e-learning is always observed. The indicator perceived self-efficacy in using e-learning has a mean of 3.41, which is described as high. This means that the perception on e-learning in terms of perceived self-efficacy of using e-learning is always observed.

Table 1. Level of Perception on E-Learning

Indicator	SD	Mean	Descriptive Level
Perceived Usefulness of E-Learning	0.66	3.78	High
Perceived Self-Efficacy of Using E-Learning	0.78	3.41	High
Behavioral Intention of Using E-Learning	0.77	3.84	High
Overall	**0.64**	**3.68**	**High**

The results show that the perception on e-learning among the respondents is high. This implies that, in their own subjective view, implementing e-learning as an alternative to traditional education is close or equivalent to the quality of education they experienced pre-lockdown. The results supported the findings of Saragih *et al.* (2019) and Muhammad *et al.* (2020). Cole *et al.* (2021) imply that in terms of investment, enthusiasm, or involvement, each student who scored this variable highly is satisfied with the quality of education they can attain from this system and will likely achieve the same level of performance whether or not the learning environment is traditional or remote.

Furthermore, the indicator with the highest mean was the behavioral intention of using e-learning. This implies that, subjectively, the respondents intend to use the e-learning platform primarily to educate themselves instead of as a means of entertainment. This does not necessarily mean that this is their sincere intention and may mean that they must be made aware of the methods to use it for other means. While this implication may seem vague, it heavily suggests that the respondents see it as another learning tool similar to Ayodele *et al.'s* (2017) research.

3.2 Personal Issues on E-Learning

The level of personal issues on e-learning is measured by the five indicators: motivation, self-esteem, personal relationships, conflict resolution, and health. The overall standard deviation of 0.52 is less than 1.00, meaning the students' responses were consistent. The overall mean of 4.06, which is described as high, denotes that the personal issues on e-learning of Grade 12 students are oftentimes observed. The indicators motivation and personal relationships obtained the highest mean of 4.15, which is described as high. This means that the personal issues of Grade 12 students in terms of motivation and personal relationships are oftentimes observed.

In conflict resolution, the mean rating is 4.08, which is described as high. This indicates that the personal issues on e-learning of Grade 12 students are oftentimes observed regarding conflict resolution. The indicator self-esteem has a mean of 4.05, which is described as high. This means that the personal issues on e-learning of Grade 12 students are oftentimes observed regarding self-esteem. Meanwhile, the indicator health obtained the lowest mean of 3.86, which is described as high, indicating that the personal issues on e-learning of Grade 12 students in terms of health are oftentimes observed.

Table 2. Level of Personal Issues on E-Learning

Indicator	SD	Mean	Descriptive Level
Motivation	0.68	4.15	High
Sel-Esteem	0.66	4.05	High
Personal Relationship	0.59	4.15	High
Conflict Resolution	0.59	4.08	High
Health	0.73	3.86	High
Overall	**0.52**	**4.06**	**High**

The results show that the overall rating of the variable personal issues on e-learning is high. In context, this means the respondents expressed an overall minimal or lack of debilitating personal issues on e-learning that would affect their physiologic health or state of mind. For students, this means that they are not experiencing any great upheaval that would affect their education, even during the restrictions posed by the pandemic.

Conversely, it could also mean that the learning environment needs to be improved in stimulating the social conflict that often appears in traditional learning. This lack of social conflict, which exposes individuals to conflict and resolution, could be framed as a negative from the perspective of personal growth. This is supported by Iwara *et al.* (2018), whose research highlights the importance of social triggers in learning.

The highest indicator is a joint between motivation and personal relationships. This result implies that even within remote learning, respondents maintain their motivation for learning and can establish meaningful relationships with their peers. This could also imply that traditional learning presented fewer opportunities for motivation and that students prefer remote learning in terms of an actual learning environment, which is similar to previous research findings of Ajloni and O'Toole (2021). Personal relationships could imply that the threshold for creating a meaningful relationship with others has fallen or that the standards for such have similarly fallen.

3.3 E-Learning Environment

Displayed in Table 3 is the list of six indicators of an e-learning environment: program effectiveness, teaching quality, ethics and professionalism, learner support, safety and convenience, and awareness of the rules. The overall standard deviation of 0.64 is less than 1.00, meaning the students' responses were consistent. The overall mean rating of the e-learning environment is 3.86, which is described as high. This indicates that the e-learning environment of Grade 12 students is oftentimes observed.

The indicator, ethics and professionalism obtained the highest mean score of 4.02, which is described as high; teaching quality has a mean of 4.00, described as high; awareness of the rules has a mean of 3.91, defined as high; learner support has a mean of 3.79, described as high; program effectiveness has a mean of 3.75, described as high; and safety and convenience have a mean of 3.72, described as high. This means that the ideal e-learning environment is oftentimes observed in terms of ethics and professionalism, teaching quality, awareness of the rules, learner support, program effectiveness, and safety and convenience.

Table 3. Level of E-Learning Environment

Indicator	SD	Mean	Descriptive Level
Program Effectiveness	0.70	3.75	High
Teaching Quality	0.72	4.00	High
Ethics and Professionalism	0.75	4.02	High
Learner Support	0.74	3.79	High
Safety and Convenience	0.80	3.72	High
Awareness of the Rules	0.72	3.91	High
Overall	**0.64**	**3.86**	**High**

Results show that, regarding the variable e-learning environment, respondents generally viewed it positively, with the score rating average set to high. This implies that, subjectively, students perceived their new learning environment as similar to traditional classroom environments regarding effectiveness, efficiency, and overall efficacy. This is consistent with the findings of Herrador-Alcaide *et al.* (2020); and Yunusa and Umar (2021), that traditional learning environments were low in quality and, therefore, could match the limited quality of remote learning quite easily.

Considering the indicators provided, it is reasonable to assume that each respondent found that the teaching staff and the institution could provide them with quality education and support, despite the limitations in distance and resources. Such an implication could further be used to provide convenience for students and teaching staff when traditional education is eventually reinstated, which is also suggested by Kimble-Hill *et al.* (2020) and Yu *et al.* (2021). The progression of the Philippine educational system will benefit greatly from more options and a well-established backup should a similar crisis eventually occur.

3.4 Attitude towards Online Learning

Presented in Table 4 is the list of the three indicators of attitude towards online learning. These indicators are interest in computers and adoption, the effectiveness of online learning, and ease-ness of using online learning. The overall standard deviation of 0.73 is less than 1.00, meaning the students' responses were consistent. The overall mean score of attitude towards online learning is 3.54, which is described as high. This means that Grade 12 students' attitude towards online learning is oftentimes observed.

The result shows that among the three indicators, the effectiveness of online learning obtained the highest mean of 3.65, described as high. The indicator ease-ness in online learning has a lower mean of 3.63, defined as high. The indicator interest in computers and adoption has the lowest mean of 3.42, described as high. This means that the attitude towards online learning of senior high school students is often manifested in the effectiveness of online learning, ease-ness of using online learning, and interest in computers and adoption.

Table 4. Level of Attitude towards Online Learning

Indicator	SD	Mean	Descriptive Level
Interest in Computers and Adoption of Online Learning	0.87	3.42	High
Effectiveness of Online Learning	0.76	3.65	High
Ease-ness in Using Online Learning	0.79	3.63	High
Overall	**0.73**	**3.54**	**High**

The results for the attitude towards online learning have been recorded as high. This result implies that, for senior high school students, online learning is a valuable and worthwhile alternative to traditional learning. They found it both easy to manage and intuitive to operate, which is understandable as the Philippines has been continuously integrating an ever-widening array of technological advancements over the past decade, as noted by Castro and George (2021); and Liu *et al.* (2022). With the barrier for entry being so low nowadays, it is understandable that youth will not only find it easy but also intuitive to operate modern gadgets.

Conversely, this may imply a dangerous overexposure and overreliance on technology for senior high-

school students. This opens official channels to manipulation, which can further escalate if the institution employs weak security measures. The general nature of online learning creates many loopholes in the system that are otherwise absent in traditional learning environments, similar to Peytcheva-Forsyth *et al.'s* (2018) research findings. Even with the most stringent security measures, the remote nature of such a system means its efficacy is primarily based on trust, which is difficult to ascertain, even more so for students than staff, as Ta'amneh (2021) found in their research.

3.5 Correlation Between Perception on E-Learning and Attitude towards Online Learning

Shown in Table 5.1 is the relationship between the perception on e-learning and the attitude towards online learning. The overall computed R-value is 0.579 with a probability level of 0.000 at a 0.05 level of significance. Thus, the null hypothesis is rejected.

This result shows a strong positive significant relationship between the perception on e-learning and the attitude towards online learning of Grade 12 students. In particular, the data revealed that all indicators of perception on e-learning showed a significant relationship to attitude towards online learning in terms of interest in computers and adoption of online learning, the effectiveness of online learning, and ease-ness of using online learning. All their p-values are less than 0.05.

The data also revealed that all indicators of perception on e-learning are positively correlated with the attitude towards online learning. Among the three indicators, perceived self-efficacy in using e-learning obtained the highest R-value of 0.534. The behavioral intention of using e-learning garnered an R-value of 0.495, and the perceived usefulness of e-learning got the lowest R-value of 0.478.

Table 5.1. Significance of the Relationship between Perception on E-Learning and Attitude towards Online Learning

Perception on E-Learning	**Attitude towards Online Learning**			
	Interest in Computers and Adoption of Online Learning	Effectiveness of Online Learning	Ease-ness in Using Online Learning	**Overall**
Perceived Usefulness of E-Learning	.396** .000	.485** .000	.427** .000	**.478** .000**
Perceived Self-Efficacy of Using E-Learning	.487** .000	.550** .000	.419** .000	**.534** .000**
Behavioral Intention of Using E-Learning	.388** .000	.533** .000	438** .000	**.495** .000**
Overall	**.488** .000**	**.603** .000**	**.492** .000**	**.579** .000**

These results show that someone's perception of e-learning significantly impacts their attitude towards e-learning. The importance of this result lies in the involvement of the individuals regarding e-learning which is consistent with the findings of Nasir and Neger (2022). This is not limited to students but also encompasses the entire teaching staff, the local government units, and the Department of Education. Suppose this result remains constant throughout these groups. In that case, it is imperative to improve upon this perception, as it will inevitably affect how much support the system gets in order to progress beyond an auxiliary and temporary means of providing education, which Kreth *et al.* (2019) and Lowenthal *et al.* (2020) both touched on in their respective papers.

Likewise, it also means that should such perception be cultivated negatively, then support for the system fails, and it is replaced or relegated as an inefficient form of education. Such an event may not happen when it is the only realistic option, as in the previous two years. However, it still stands that such attention is necessary to produce quality alternatives to education. A positive perception on technological integration can, in the future, open doors to other opportunities as ever more technological advancements become available to the Filipino people, which is supported by Ibrahim *et al.* (2019).

3.6 Correlation Between Personal Issues on E-Learning and Attitude towards Online Learning

Presented in Table 5.2 is the relationship between personal issues on e-learning and attitude towards online learning. The result reveals that the overall computed R-value is 0.417 with a probability level of 0.000 at a 0.05 level of significance. Therefore, the null hypothesis is rejected. This result confirms a significant relationship between personal issues on e-learning and attitude towards online learning. Specifically, the data revealed that all the indicators of personal issues on e-learning showed a significant relationship to attitude towards online learning in terms of interest in computers and adoption of online learning, the effectiveness of online

learning, and ease-ness of using online learning. All their p-values are less than 0.05.

The data also revealed that all indicators of personal issues on e-learning positively correlate with the attitude towards online learning. Among the five indicators, motivation obtained the highest R-value of 0.381; health obtained an R-value of 0.367; conflict resolution garnered an R-value of 0.339; self-esteem obtained an R-value of 0.320; and personal relationship obtained the lowest R-value of 0.258.

Table 5.2. Significance of the Relationship between Personal Issues on E-Learning and Attitude towards Online Learning

Personal Issues on E-Learning	**Attitude towards Online Learning**			
	Interest in Computers and Adoption of Online Learning	Effectiveness of Online Learning	Ease-ness in Using Online Learning	**Overall**
Motivation	.324** .000	.379** .000	.336** .000	**.381** .000**
Self-Esteem	.299** .000	.274** .000	.296** .000	**.320** .000**
Personal Relationship	.205** .000	284** .000	.220** .000	**.258** .000**
Conflict Resolution	.284** .000	.365** .000	.280** .000	**.339** .000**
Health	.330** .000	.337** .000	.334** .000	**.367** .000**
Overall	**.362** .000**	**.408** .000**	**.368** .000**	**.417** .000**

The results show that, for Grade 12 students, the presence or absence of personal issues on e-learning according to the pre-defined indicators significantly impacts their attitude towards online learning. Numerous studies have been made to connect a student's state of mind to their academic performance, yet the novel remote learning environment holds the same basic principle. Disregarding all other external stimuli, the less the stress of personal issues burdens a student, the more they can concentrate on their education and the better their attitude towards it, something supported by Carta *et al.* (2021) and Repal *et al.* (2022) prior research studies.

Likewise, this means that managing personal issues at home must be given a different focus, as this is different from the standard status quo. Traditional education may provide counseling and on-the-spot intervention to alleviate or eliminate such issues, but this is only sometimes available or efficient for remote learning. This result confirmed the earlier findings of Min *et al.* (2021) that debilitating issues may cause student stress, lowering their involvement in education and eventually detrimental to their learning habits.

3.7 Correlation Between E-Learning Environment and Attitude towards Online Learning

Shown in Table 5.3 is the relationship between the e-learning environment and attitude towards online learning. It can glean from the table that the overall R-value is 0.774 with a corresponding p-value of 0.000, which is less than the 0.05 level of significance. This leads to the rejection of the null hypothesis. This implies a strong positive significant relationship between the e-learning environment and the attitude towards online learning of Grade 12 students. Notably, the data revealed that all indicators of the e-learning environment showed a significant relationship to attitude towards online learning in terms of interest in computers and adoption of online learning, the effectiveness of online learning, and ease-ness of using online learning. All their p-values are less than 0.05.

The result further revealed that all indicators of the e-learning environment are positively correlated with the attitude towards online learning. Among the six indicators, learner support got the highest R-value of 0.741. Program effectiveness obtained an R-value of 0.729; safety and convenience garnered an R-value of 0.724; teaching quality got an R-value of 0.644; awareness of the rules got an R-value of 0.617; and ethics and professionalism obtained the lowest R-value of 0.571.

Table 5.3. Significance of the Relationship between E-Learning Environment and Attitude towards Online Learning

E-Learning Environment	**Attitude towards Online Learning**			
	Interest in Computers and Adoption of Online Learning	Effectiveness of Online Learning	Ease-ness in Using Online Learning	**Overall**
Program Effectiveness	.681** .000	.662** .000	.640** .000	**.729** .000**
Teaching Quality	.582** .000	.639** .000	.535** .000	**.644** .000**
Ethics and Professionalism	.506** .000	.580** .000	.472** .000	**.571** .000**
Learner Support	.682** .000	.703** .000	.635** .000	**.741** .000**
Safety and Convenience	.699** .000	.632** .000	.635** .000	**.724** .000**
Awareness of the Rules	.572** .000	.592** .000	517** .000	**.617** .000**
Overall	**.716** .000**	**.732** .000**	**.660** .000**	**.774** .000**

The results show that the quality of an e-learning environment directly correlates to a student's attitude towards e-learning. This is self-explanatory, and the results only reinforce the well-accepted fact that the specific environment being used for learning will be a determinant of the quality of education itself. Per previous findings of Herrador-Alcaide *et al.* (2020); and Yunusa and Umar (2021), the learning environment is critical to the efficient flow of education, as it allows for focus, organization, and efficiency. This is even more distinct in remote learning or e-learning environments, as the environment changes drastically from student to student.

Likewise, the maintenance of this environment, whose onus is on the teaching staff, also reflects their technical skills, management, and charisma. Remote learning relies on non-physical means of exerting control; thus, it relies a lot on authority and charisma to produce the desired effect, which was likewise found by Valantinaitė (2020) and Yang *et al.* (2021). Any deficiency in these fields can cause a drop in the quality of the learning environment, which in turn, degrades the experience and quality of education experienced by the student.

3.8 Influence of Perception on E-Learning, Personal Issues on E-Learning, and E-Learning Environment on Attitude Towards Online Learning

Presented in Table 6 are the multiple regression analysis results. The output shows that the three independent variables, perception on e-learning, personal issues on e-learning, and e-learning environment, are predictors of attitude towards online learning. They are statistically significant because their p-values equal 0.000.

Moreover, it shows that the perception on e-learning and e-learning environment as predictors of attitude towards online learning have positive standardized betas of 0.285 and 0.882, respectively. The regression table model significantly predicts the outcome variable. The R^2 value is 0.656, which means that the factors explain 65.60% of variances in the model.

Furthermore, the prediction equation is AOL = 0.278(constant) + 0.285(POE) – 0.295(PIE) + 0.882(EE). This equation means that the attitude towards online learning is predicted to increase by 0.285 and 0.882 when the perception on e-learning and e-learning environment go up by one, respectively, and decrease by 0.295 when the variable personal issues on e-learning go up by one, and are predicted to be 0.278 when the three variables are zero.

Table 6. Significance of the Influence of Perception on E-Learning, Personal Issues on E-Learning, and E-Learning Environment on the Attitude towards Online Learning

Attitude towards Online Learning				
Exogenous Variables	*B*	β	*t*	*Sig.*
Constant	.278		1.582	.114
Perception on E-Learning	.285	.250	6.962	.000
Personal Issues on E-Learning	-.295	-.211	-5.318	.000
E-Learning Environment	.882	.775	18.447	.000

R	.810
R^2	.656
ΔR	.654
F	252.160
ρ	.000

These results show that all variables presented in this study were shown to have a significant effect on a student's attitude towards online learning. However, the most significant variable is the e-learning environment. This is understandable to a certain degree. The primary difference between traditional and remote learning is, after all, in the environment being used to facilitate education. The primary differences of location, supervision, and supportive facilities combined to create a unique yet familiar environment that students can quickly adapt to are challenging to maintain by educators, supported by Wang *et al.* (2019) and Martin *et al.* (2021).

Naturally, this means that further attention should be allocated to providing an excellent learning environment regarding program effectiveness, ethics and professionalism, learner support, safety and convenience, and awareness of the rules. Except for safety and convenience, all these indicators are those present in traditional learning environments but challenging to implement in an e-learning environment, something also highlighted in Ariya and Kitti's (2021) literature. In time, and with enough investment, both the involvement and quality of e-learning can be improved through the positive attitude of students, teaching staff, and government officials towards e-learning.

3.9 Best Fit Model

Presented in Table 7 is the summary of standard fit indices of the structural models. It can be gleaned from the table that models 1 – 4 failed to satisfy all the criteria in each index; thus, these models are considered not good fit models for the dependent variable attitude towards online learning. Moreover, all standard fit indices of model 5 are within the required criteria: p-value equals 0.090; CMIN/DF equals 1.469; GFI equals 0.985; CFI equals 0.995; NFI equals 0.985; TLI equals 0.990; RMSEA equals 0.034; and p-close equals 0.819. The result implies that model 5 is the best fit. Thus, the null hypothesis is rejected, stating that no structural model best fits the attitude towards online learning.

Considering each variable's interconnectivity and indicators, it was necessary to create a model that best fits the links between the three independent variables of perception of e-learning, personal issues on e-learning, and e-learning environment with the dependent variable attitude towards online learning and its indicators. As illustrated by Table 7, out of all models created, Model 5 best fits this interconnectivity because it links all significant indicators of each independent variable to the most significant indicators from the dependent variable.

Table 7. Summary of Goodness of Fit Measures of the Five Generated Models

Model	P-value (>0.05)	CMIN / DF (0<value<2)	GFI (>0.95)	CFI (>0.95)	NFI (>0.95)	TLI (>0.95)	RMSEA (<0.05)	P-close (>0.05)
1	.000	7.725	.791	.848	.830	.822	.130	.000
2	.000	5.823	.837	.893	.874	.872	.110	.000
3	.000	5.321	.838	.903	.884	.886	.104	.000
4	.000	4.609	.859	.921	.901	.904	.095	.028
5	.090	1.469	.985	.995	.985	.990	.034	.819

Legend:

CMIN/DF – *Chi Square/Degrees of Freedom*
GFI – *Goodness of Fit Index*
CFI – *Comparative Fit Index*
NFI – *Normed Fit Index*
TLI – *Tucker-Lewis Index*
RMSEA – *Root Mean Square of Error Approximation*

Using Model 5 as the foundation, the following can be ascertained: The perceived usefulness of e-learning, perceived self-efficacy of using e-learning, health, conflict resolution, motivation, ethics and professionalism, and program effectiveness - indicators from the independent variables - all have significant impact on interest in computers and adoption of online learning, as well ease-ness in using online learning, which are indicators of the dependent variable.

In this setting, this implies that the subjective outlook of students is just as important as the performance of the institution and the educators themselves, as well as the unique local environment they experience during their learning sessions. This is supported by Siu-Cheung (2021), whose research handled teacher performance, and Tiong-Thye and Yang (2021), whose research tackled the issue of learning environments and student involvement. Realistically, such a concept is readily observable within traditional learning environments, except those environments are much more controlled than the e-learning system, requiring such research to quantify the unknown variables that set it apart from traditional learning.

Presented in Figure 2 is the generated Model 5 of the interrelationship between the exogenous variables and its causal relationship to attitude towards online learning. From the three independent variables, the following indicators from each were found to significantly influence the dependent variable of attitude towards online learning with its variables interest in computers and adoption of online learning, and ease-ness in using online learning. From the perception on e-learning, the perceived usefulness of e-learning and perceived self-efficacy of using e-learning were found to be significant. From personal issues on e-learning, health, conflict resolution, and motivation were found to be significant. From the e-learning environment, ethics and professionalism, as well as program effectiveness, were found to be significant.

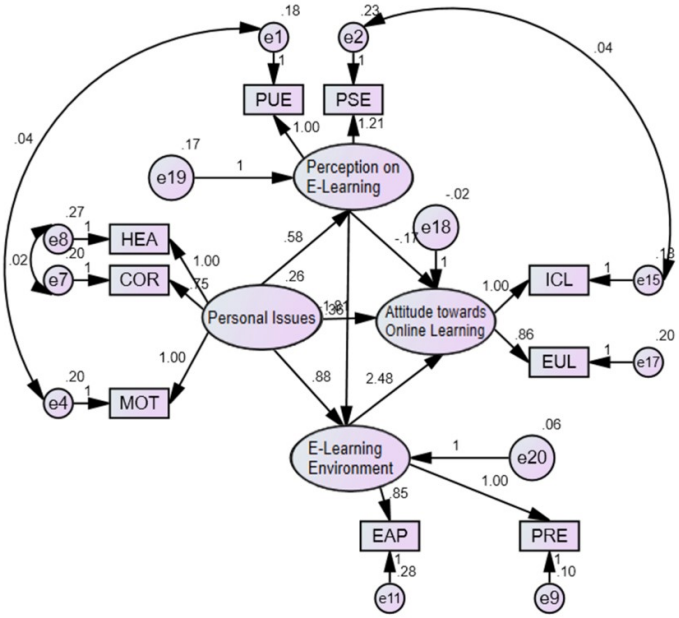

Figure 2. Best Fit Structural Model for Attitude Towards Online Learning

PUE - Perceived Usefulness of E-Learning
PSE - Perceived Self-Efficacy of Using E-Learning
HEA - Health
COR - Conflict Resolution
MOT - Motivation
EAP - Ethics and Professionalism
PRE - Program Effectiveness
ICL - Interest in Computers and Adoption of Online Learning
EUL - Ease-ness in Using Online Learning

4. Conclusion and Recommendation

The perception on e-learning, personal issues on e-learning, and the e-learning environment were found to impact the dependent variable of attitude towards online learning significantly. From this, it is recommended that educational institutions and teaching professionals engage in more specialized training and familiarization with the technology and platform in question, as financially supported by their respective budgets. Students may be more aware of the issues they face and how to deal with them during their participation in online learning, as this is one of the few variables under their direct control.

Additionally, as the variable with the most significant impact on attitude towards online learning was the

e-learning environment, this further emphasizes that many subjective and objective cues students take come from the specific background they experience during e-learning. First, it may be recommended that administrators pay particular attention to the e-learning environment the educators under them set up and be aware that this is affected by both training and funding. Teaching professionals may be knowledgeable that with a proper mastery of their respective platforms, their providence of an e-learning environment will likewise improve.

Overall, the conclusions drawn from the data point towards the importance of attention and priority given to the issue at hand, which is congruent with David's (2015) E-learning theory. E-learning, while temporary in today's situation, and its significance to future education should not be ignored, as many of the variables that affect its impact on education are relevant to many other fields and applications in education - something which is reflected in Bryant *et al.'s* (2013) Behaviorist Learning Theory. Future researchers should take these findings as they may be helpful when a similar crisis once again necessitates the nationwide adoption of e-learning methods. The methodologies and scope, while limited, nevertheless shows an accurate representation of the issues at hand on a local level and may be used as is for a similar measure in future inquiries.

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