

Challenges in Facilitating Online Teaching for Secondary Education during the Covid-19 Pandemic, based on a case study in Sri Lanka.

Arosha de Silva

Sri Lanka Institute of Information Technology

Arosha de Silva (✉ aroshdasilva@hotmail.com)

Sri Lanka Institute of Information Technology

Research Article

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Abstract

This research aims to evaluate the challenges in facilitating online teaching for secondary education during the Covid-19 pandemic based on a case study in the western province of Sri Lanka. With the pandemic, teachers had to face many challenges concerning online teaching, as they were unprepared for the remote teaching process that was to follow. For this research, teachers were able to give an account of their experiences, challenges and the sacrifices that had to be made in adapting to this new method of teaching. A mixed method of data collection and analysis was used in this research, as both quantitative and qualitative methods in combination would provide a better understanding of research problem enhancing the validity of the results. Through the findings of this research, it was revealed that most schools and its teachers had embraced online teaching in the midst of the many challenges during Covid-19. Thereby it is vital that measures are taken to overcome and to mitigate the effects these challenges faced in online teaching, making it possible for teachers to deliver an online education for students that is on par with other technologically advanced education system.

Introduction

The use of technology in teaching has led to a paradigm shift in the entire education system. Contemporary education involving technology supports a more technologically driven, more flexible and a more learner centered teaching environment.[1] This has made way for online teaching which has enabled teachers to reach out students on a digital platform. The online teaching process is comprised of academic, technical and administrative components thereby it is mandatory that the online teaching environment include these components in order to accomplish the effective execution of online education. In the wake of the global pandemic Covid-19 education methods had to change drastically. Educational reforms were brought in immediately so that transition and a smooth flow in education could take place. Online teaching took a center stage in the education system but the challenges in facilitating in online teaching were many Therefore this study intends to determine the challenges in facilitating online teaching for secondary education during the Covid-19 pandemic.

The education system was not equipped to face a change of this magnitude as a fully digitized education system had not been tried out before. The challenges faced in online teaching were common to all but the impact of it was mostly felt by developing nations where technological methods of teaching were not commonly practiced. [2] In Sri Lanka digitized education was at its inception at the start of the pandemic but within a short span of time a rapid change took place in the education system as teachers took the challenge of switching from conventional teaching to digitized teaching. With the unexpected digital transformation in education it was clear that teachers had no time for preparation, they had to depend on the devices and the technological skill they already possessed. Affordability and accessibility to teaching resources were said to be inadequate and challenging as teachers come from various socioeconomic backgrounds. [3] Limited funds were allocated by authorities for this process thereby the online teaching expenditure was selflessly born by teachers. There was teacher's resistance to change as technological integration and change in work patterns in teaching created tension. [4] The

direct human contact and interaction the teacher had with the students was not felt in distance learning thereby it created barrier between the student and teacher. Also Online teaching was quite an isolating process for the teachers as they did not have the required support of the community or colleagues. A robust IT infrastructure had not been available in the field of education to face this crisis thereby teachers had to make do with the resources they already had.

Many are the challengers in facilitating online teaching for secondary education during the Covid-19 pandemic yet it is evident that regardless of all the challengers faced, teachers have found ways and means to continue with the online teaching process. [5] In spite of all the resistance and the drawbacks, it is an obvious fact that online teaching continued solely because of the ability teachers possessed to adapt to the situation and the passion they had towards teaching. This research intends to identify the challengers in facilitating online teaching for secondary school during the covid-19 pandemic in order to find solutions to the challengers so that a smooth flow in online teaching could take place. In finding these gaps a mixed method of data collection and analysis would be utilized which would provide a comprehensive understanding of the challengers faced by secondary school teachers in online teaching during the Covid-19 pandemic. The future of successful online teaching would determine on how successful we are in overcoming the challengers faced by teachers in online teaching.

1.1 The Aim and Objectives of the Study

The aims and objectives in this research would be able to establish the space, the depth and the path this research would be taking. The aim of this research indicates *what* needs to be achieved, and objectives indicate how it would be achieved.

1.2 Research Question

What are the challenges in facilitating online teaching for secondary education during the Covid-19 pandemic?

1.3. Research Hypothesis

Hypothesis # 1: Motivation would have a positive impacted on teachers who engage in online teaching during Covid-19.

Hypothesis # 2: The lack of proper IT Infrastructure would have a negative impact on teachers who engage in online teaching during Covid-19.

Hypothesis # 3: There is a relationship between time management and the increased workload in online teaching during Covid-19.

Methodology

For this research several systematic analysis methods were applied. A mixed method was used for this study, initially a qualitative analysis followed by a quantitative analysis. This research also highlights methods utilized for the collection of data and the instruments used for the process. The qualitative data would be obtained through interviews conducted with experts in the field. This qualitative data would be analyzed using a thematic analysis. The quantitative data would be collected with the use of a questionnaire that would be distributed among teachers in the western province. This quantitative data that is collected would be analyzed statically using multiple regression analysis. The validity and reliability of the data analysis would be concluded with the highest reliability and accuracy. All ethical considerations used during the course of data collection was handled adhering to the best practices in protecting the confidentiality of all participants.

2.1 Research Design

A research design shows the collecting of data, its analysis, its interpretation and the reporting of data. The research design shows the complete plan in connecting and answering the research question, bring forth the required results. [6] This research would involve a mix of methods for analysis and data collection. A mixed method is described as a combination of research methods applied in a research. For this research both quantitative and qualitative methods would be utilized. The qualitative approach was utilized to ascertain the data needed to carry out a thematic analysis. A multiple regression analysis was done with the quantitative data that was obtained from the questionnaire that was circulated among teachers in the western province. This mixed method of both quantitative and qualitative data analysis would ensure the research problem is effectively addressed.

2.2 Population

Population is a group of individuals with a particular set of attributes. A sample is the subgroup of the population. A sample study is done by choosing a sample from the population. [7] Out of a population of 1501448 the sample size was obtained as 277 thereby 10 schools were selected from each of the three districts in the western province. 277 teachers participated in the research accordingly. As planned out, 277 respondents representing Government schools, Private schools and International schools in the western province made their contribution to the research.

2.3 Sample Size

This is a component of a research design which has a considerable effect on the strength and its scientific significance. [8] This study would use a sample of respondents from the western province. From a population of 1501448 teachers in the western province the sample size obtained would be approximately 277. Thereby 277 respondents participated in the research.

Formula to calculate sample size

Population size - 1501448

Confidence level - 90%

Margin of error - 5%

Sample proportion - 0.5

Sample size - 277

2.4 Data Collection Methods

A procedure is used for the collection of data from related sources in finding answers to the research problem. There are several data collection methods used in a research. The method of collecting data should be done to suit the line of study. [9] There were two methods of data collection used for this research. The first qualitative data collection method and the second quantitative data collection method. Qualitative data was collected through interviews that were conducted with experts in the field and quantitative data was collected with the aid of a questionnaire that was given to teachers who had experience in the online teaching process.

2.5 Interviews

Research interviews are carried out to explore the views expressed by a group of individuals on a specific topic. This data gathered would be used for qualitative analysis. [10] Data was collected through an

interview where the participants answered an open end question. Twenty participants were selected for the interview, these participants were experts in the field of education. The participants work experience and their current positions in the field of education were taken into consideration in the selection. These participants had been involved in the online teaching process from its inception thereby had gained a wealth of experience in handling the task. For the interviews the participant's expertise and experience in the online teaching process would be greatly valued. Various methods were applied in order to keep record of what was expressed during the interview by the participants. These methods included taking notes and audio-recordings. The audio recordings were transcribed verbatim before data analysis. The transcribed audio-recorded interview was then generated into a written dialogue. Notes that were taken during the interviews provided important context to the interpretation of audio-recordings. Which later on would help remind factors that are important for data analysis. The audio recordings and transcripts obtained from the interviews would be utilized in the qualitative data analysis that would follow.

2.6 Questionnaire

This is taken as the key tool for gathering data in a survey of a research. A questionnaire is used for the collection of individual data based on a specific topic. [11] For this research the questionnaire was built based on the information obtained at the interviews. This data was then classified into several categories in order to construct the questionnaire. [12] The questionnaire was translated into both Sinhala and Tamil to suit the requirements of the teachers and their mode of language. The questionnaire was given out to schools in the western province which included government schools, private schools and international schools. The distribution of the questionnaires was done both physically and electronically through Google docs and email. With the data collected from the questionnaire a multiple regression analysis was done, hence identifying scales were used for the process. Identifying processes included taking into account the data obtained from the entire sample population.

2.7 Validity and Reliability of the Research

Reliability and Validity of a research are entirely based on the research reliability and validity of outcomes and the assumptions drawn by them. [13] The data obtained for this research was obtained through credible sources and are cited accordingly. Validity of a research is entirely based on the accuracy of the measurement of the concepts in a quantitative analysis. [14] The data that was obtained through the quantitative analysis was validated using multiple regression analysis. This analysis examines findings and measures its reliability and stability. [15] All the data that was tested delivered reliable results as the sources that the data was obtained from were reliable as previously stated in the research.

2.8 Ethical Consideration

When research is done using human data, ethical values and conduct should be taken into consideration. [16] In this research confidentiality of the information obtained from the respondents were done respecting their rights and privacy. Throughout the process the respondents were informed that this research would be done for academic purposes. The respondents were requested not to write their names in any of the forms provided in this research so that confidentiality could be observed. The research was done adhering with ethical considerations and principles guaranteeing anonymity and citing all the work used as reference.

Analysis

A research data analysis is done by researchers in order to analyze data obtained in the process. The procedure is also responsible in interpreting results, give insights to the research problem giving it more clarity. [17] For this research two types of data analysis was performed namely qualitative analysis and quantitative analysis. For the analysis the previously collected qualitative and the quantitative data would be used.

3.1. Qualitative Analysis

Qualitative analysis is a process that is designed to concise raw data into themes or categories based on its validity and its interpretation. Inductive reasoning is used for this process where the researcher carefully examines and compares the data. [18] From the qualitative data obtained, a thematic analysis would take place in this research.

3.1.1 Thematic Analysis

This analysis systematically recognizes organizes and categorically sorts the data into themes. This allows the researcher to recognize the data with more clarity and understanding. [19] For this analysis the qualitative data that was collected during the interview was first documented, these transcripts were then carefully scrutinized and categorized. The important features of the data that was of relevance was extracted and coded for further clarity. The coding was then examined to identify significant patterns and themes. The themes were reviewed to check if it reveals a convincing pattern of data that answered the

research question. The themes were categorized as Motivation, IT infrastructure, Time management and Increase workload. The analytical narrative was weaved together to draw up a thematic analysis map which was the final outcome of the analysis.

Thematic Analysis

A. Motivation

Question: What are the challenges in facilitating online teaching for secondary education during the Covid-19 Pandemic?

B. IT Infrastructure

Question: What are the challenges in facilitating online teaching for secondary education during the Covid-19 Pandemic?

C. Time Management

Question: What are the challenges in facilitating online teaching for secondary education during the Covid-19 Pandemic?

D. Increased workload

Question: What are the challenges in facilitating online teaching for secondary education during the Covid-19 Pandemic?

Thematic Analysis Map

3.2 Quantitative Analysis

This analysis is done with the numeric data. This type of analysis is involved when the research is scientific in its approach. This method of analyzing statistical data involves less time thereby more data can be collected and analyzed in a shorter period of time. Using software such as SPSS “Statistical Package for the Social Sciences” for a qualitative analysis would help save a lot of time and effort. [20] Prior to this process a questionnaire was utilized to collect quantitative data and later the quantitative data collected was analyzed to generate results.

3.2.1 Multiple Regression Analysis

This method of analysis is commonly utilized for quantitative analysis purposes. For this analysis special analysis software was used. Through this analysis various types of data problems could be solved bring in more clarity and accuracy to the analysis. [21] For this statistical analysis multiple regression data analysis was used. The data obtained was sent through the analysis process with the use of the Statistical Package for the Social Sciences (SPSS), the data feed passed the required assumptions for multiple regression and thereby valid results were obtained. The results were presented in the form of tables and graphs. The table would include regression coefficients, standard errors, statistics indicating significance, and goodness-of-fit statistics. The graphs would include histograms and p-p charts.

A. Validity and Reliability Test

In a quantitative analysis validity is defined as the level of which concepts are measured accurately whereas reliability shows the consistency of measures.[22] For this analysis all the independent variables, dependent variables that are operational were used. The model taken for this analysis was the alpha model. The validity and reliability test are shown in the reliability statistics table and the ANOVA table.

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The 3.4 Reliability Statistics Table shows that the Cronbach's alpha is at (.858). Thereby the internal consistency is considered excellent as it is above (.70).

The 3.5 ANOVA Table shows that the value of F is at (2064.174), which reaches significance with a p -value of (.000) which is less than the (.05) alpha level. This means there is a statistically significant difference between the different levels of the challengers faced in online teaching.

B. Normality Testing

The two methods used in normality testing are graphical methods and numerical methods. [23] For statistics Skewness and Kurtosis was selected. For Histograms normal curve on Histogram was selected. If the Kurtosis curve is greater than (3) it is taken as Leptokurtic, if the Kurtosis curve is less than (3) it is taken as Platykurtic.[24] This analysis included Frequency table and Histograms.

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The 3.6 Statistics Table denotes the Skewness of the dependent variables are between (-1) and (+1) which shows the distribution is highly skewed. Since the kurtosis values are less than (3) the dataset shows a lighter tail than shown in a normal data distribution. This says that the data are Flatted or Platykurtic.

Frequency Table

Histogram - Motivation

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The 3.7 Frquency Table denotes that the independent variables in Motivation are between (-1) and (+1) which shows the distribution is highly skewed. Since the kurtosis values are less than (3) the dataset shows a lighter tail than shown in a normal data distribution. This says that the data are Flatted or Platykurtic.

Figure 3.1 Motivation Histogram shows the set of data that's displayed according to the Motivation Frequency Table.

Frequency Table

Histogram – IT Infrastructure

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The 3.8 Frquency Table denotes that the independent variables in IT Infrastructure are between (-1) and (+1) which shows the distribution is highly skewed. Since the kurtosis values are less than (3) the dataset shows a lighter tail than shown in a normal data distribution. This says that the data are Flatted or Platykurtic.

Figure 3.2 IT Infrastructure Histogram shows the set of data that's displayed according to the IT Infrastructure Frequency Table.

Frequency Table

Histogram - Time Management

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The 3.9 Frequency Table denotes that the independent variables in Time Management are between (-1) and (+1) which shows the distribution is highly skewed. Since the kurtosis values are less than (3) the dataset shows a lighter tail than shown in a normal data distribution. This says that the data are Flatted or Platykurtic.

Figure 3.3 Time Management Histogram shows the set of data that's displayed according to the Time Management Frequency Table.

Frequency Table

Histogram - Increased Workload

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The 3.10 Frequency Table denotes that the independent variables in Increased Workload are between (-1) and (+1) which shows the distribution is highly skewed. Since the kurtosis values are less than (3) the dataset shows a lighter tail than shown in a normal data distribution. This says that the data are Flatted or Platykurtic.

Figure 3.4 Increased Workload Histogram shows the set of data that's displayed according to the Increased Workload Frequency Table.

C. Correlation Analysis

This analysis is done to analyze relationships among both independent and dependent variables. [25] If there is (+) or (-) at the start of a Pearsons correlational coefficient value, it would indicate that there is a negotive or positive corelation between the variables. Theres no relationship beteen variables if theres (0) indicted.

Report

The 3.11 Correlations Table denotes that the Pearson Correlation for Motivation, IT Infrastructure, Time Management and Increased Workload, is at (1) and the Sig. (2-tailed) is at (.000) which indicates that the correlation is of highest significance.

The Correlations Table also shows the Pearson Correlation between Time management and Increased Workload at (.352) this indicates that there is a relationship between Time Management and the Increased Workload in online teaching during Covid-19. This satisfied Hypothesis # 3 which predicted that there is a relationship between Time Management and the increased Workload in online teaching during Covid-19.

D. Multicollinearity Analysis

Multicollinearity takes place when the multiple regression analysis involves multiple variables that are correlated with the dependent variables and with each other. [26] Multicollinearity affects p-values and coefficients but has no influence on the predictions.

Reporting

Two diagnostics were done to identify Multicollinearity:

- Analysis of the correlation matrix.
- Compare the tolerance values with the variance inflation factor.

- Analysis of the correlation matrix

Correlation matrix lets you compare correlation of coefficients of an independent variable. Pearson's correlation differs between (+1) and (-1). (+1) indicates that it's a positive correlation whereas (-1) indicates that it's a negative correlation. (0) indicates that there is no correlation. [27] The 3.12 Correlations Table shows that the Pearson Correlation for Motivation, IT Infrastructure, Time Management and Increased Workload is at (1) and the Sig. (2-tailed) is at (.000) which indicates that the correlation is of highest significance.

- Compare the tolerance values with the variance inflation factor.

In values that are of low tolerance a high level of multicollinearity is shown. To analyze this composition, variable that is dependent is selected into dependent and also composition variable that's independent into

independent.[28] Lower tolerance value reflects a higher degree of multicollinearity. When the tolerance value is greater than (2) and the variance inflation factor is less than (5) there is no risk of multicollinearity. The tolerance values in the 3.13 Coefficients Table were higher than (0.2) and the VIF values were less than (5) thereby it was shown that the VIF values were within the expected range which indicated that the multiregression analysis could be carried out.

E. Collinearity Diagnostics

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Most experts in the field take (30) as the number that is used for further investigation. [29] The 3.14 Collinearity Diagnostics Table shows that the Variance Proportion columns values are less than (90) thereby it could be said that there is no collinearity problem between the predictors. Collinearity Diagnostics Table indicates that the values in the condition index is less than (30) and the values in the Eigenvalue column are close to zero thereby there would be no collinearity.

F. Model Summary

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The model summary should not be less than (1) and not greater than (3) when it's the Durbin Watson value. [30] In the 3.15 Model Summary Table the Durbin Watson value is shown at (1.711) which meets the said criteria. This table represents the summary where the *R* squared value is at (.878). The statistical significance is at (.001) thereby the $P < (.05)$ criteria is met. The *R* squared value that is at (.878) shows that variants in the challenges faced in online teaching were predicted from the level of predictors. This shows that the prediction level is good. The **Model Summary** shows *R* at (.937) *R* square at (.878) adjusted *R* square at (.877) and also the standard error of the estimate at (.420). This indicates how well the data fits in the regression model. In the multiple *correlation coefficient* *R* is shown at (.937) which indicates that there is a good level of prediction. *R* is known to be the measure of quality of a dependent variable that would be predicted.

G. ANOVA table

Reporting

ANOVA test are done to check if the regression is good for data analysis. The regression is considered good for data analysis if the significant value is less than (0.0005). [31] The 3.16 ANOVA Table was able to statistically predict variables that are dependent. It also checked if the multiple regression model was a good fit for the analysis of data. In this analysis the ANOVA Table indicated the independent variables that are the protectors, were statistically able to predict the dependent variable that are the challengers faced in online teaching. It also shows that the F value is at (491.323) and the Sig value is at (.001) which indicates that the $P < (.05)$ criteria is met.

H. Coefficients

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The 3.17 Coefficients table shows that $p < (.05)$, thereby it could be said that the coefficients are statistically and significantly different from (0), this indicates that the correlation coefficient is "significant." The Coefficients indicate as to how the dependent variables varies from the independent variable when all of the other independent variables are constant. [32]

Unstandardized Coefficients B shows that Motivation which is at (.152) and Increased workload which is at (.287) has a positive impact whereas IT Infrastructure which is at (-.059) and Time Management which is at (-.017) has a negative impact on the Challenges in facilitating online teaching. Which confirms the first and the second hypothesis.

This reporting satisfies Hypothesis # 1 which predicted that the decrease in Motivation which indicates the lack of motivation in teachers would have a positive impacted on teachers who engage in online teaching during Covid-19.

And Hypothesis # 2 which predicted the lack of proper IT Infrastructure would have a negative impact on teachers who engage in online teaching during Covid-19.

I. Residual Statistics

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The 3.18 Residual Statistics Table shows the residual standards of both minimum and maximum values are not less than or more than (3). If it does it's an outlier which needs to be removed and the test should be redone. [33] In this table the minimum residual value is shown at (-.973) and the maximum at (1.110) which meets the said criteria without outliers. Linear regression involves the interpretation and the analysis of various residuals in order to confirm the expectations of statistical tests. [34]

P Plot

Reporting

Figure 3.5 P-P Plot shows that the plot distribution is normal thereby the dependent variables are distributed well. The P-P plot observations are shown in the form of short lines. The predicted line in regression is shown in the form of a solid diagonal line. The diagonal line indicates that there are normally distributed residual values.

Scatterplot

Reporting

Figure 3.6 Scatterplot shows that the plot distribution of both positive and negative sides of the horizontal line data are presented. The vertical distance is the residual. A dot in the scatter plot indicates one single data point. The several dot that are scattered on the scatter plot shows that there's low correlation between variables. It could be said that this scatter plot has a low positive correlation as the height of the dots shows a slight increase.

Recommendations

Many are the pedagogical and technological challengers faced in online teaching nevertheless measures could be taken to overcome these challengers, firstly by giving ear to the teacher's involved in the online teaching process. Teachers need the support of the authorities in overcoming the challengers faced in online teaching as they are unable to carry out the process single handedly. The revamping or rebuilding of the technological infrastructure should be of paramount importance. Online educational portals could be introduced so that an error free, user-friendly, robust, interactive online teaching and learning could take place. Adequate funds should be allocated for this process so that both teacher and student could benefit from it. Teachers should be given the required devices and the software needed for teaching as it was discovered in this research that teachers purchased devices and software at their own expense. The cost of data has also effected the online teaching process there by teachers should be given an allowance or free data so that they would not have to limit their teaching because of the cost of data. Steps should be taken to digitize print material so that the online teaching and learning would be convenient and less time consuming for both student and teacher. Computer literacy of teachers should be improved by providing training and the required learning resources so that the teachers would not fear technology or resist its use. Teachers need to be given the required support from the schools administration and government authorities so that they would have the confidence and the assurance to

continue in the online teaching process. It was revealed that the sudden switch to online teaching had an adverse effect on teachers both emotionally and socially. Teachers had been under stress and even experienced burnout as they were unable to cope with the increased workload and the management of time. Measures should be brought in so that teachers would be given proper training on how to cope with online teaching so that teachers would be able to achieve their full potential in online teaching. Also teachers have been feeling a sense of disconnection with fellow teachers as they were unable to share their problems or collectively find solutions to the problems that they were faced with in online teaching. It is necessary that programs are introduced in order to bring about emotional and social wellbeing in teachers so that teachers would experience greater satisfaction in teaching.

Conclusion

The findings of this research indicated that the challenges in facilitating online teaching during the COVID-19 pandemic for secondary schools were many. Teachers were unprepared and unequipped to face the sudden switch from conventional teaching to online teaching and also to take up a task of this magnitude. Although the data collected in this research revealed that the teachers encountered many challenges in online teaching it was also revealed that despite of all the challenges, the teachers continued the online teaching process. For this research a mixed method of data collection and analysis was conducted. The integration of qualitative and quantitative data collection and analysis provided a comprehensive and clear understanding of the final outcome of the research.

The transition from conventional teaching to online teaching made the teachers vulnerable to the new process of teaching, which was a considerable demotivating factor. The teachers lacked the environment, the resources, the skills and the experience to confidently engage in the online teaching process. There were many shortcomings in the IT infrastructure as it failed to provide the services, equipment and the facilities that was required for online education. Teachers found it difficult to manage their time with the new method of teaching and the increased work load. Thereby it is vital that authorities take necessary steps to provide the teachers with the needed requirements to face the new technological era of education. The teachers should be given the proper training to develop the required skills and knowledge to pursue the task of online teaching.

Although this year has been a process of mastering online teaching, it could be said through trial and error the set targets and goals were achieved, despite the numerous challenges encountered in online teaching during the Covid-19 pandemic. Through the findings of the research it was revealed that the pandemic had not stalled or hindered online teaching but teachers had been at work catering to the educational needs of each and every student in spite of the drawbacks and the hardship faced in the process. In the midst of all the challenges the pandemic showcased the resilience and commitment of teachers, the determination and courage they possessed in taking up any challenge in any given situation.

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Abbreviations

df	Degrees of Freedom
IT	Information Technology
ICT	Information Communication Technology
N	Total number of Observations
SPSS	Statistical Package for the Social Sciences
Std. Dev.	<i>Standard Deviation</i>
sig	Significance
Std. Error	Standard Error
VIF	Variance Inflation Factor

Declarations

Ethics approval and consent of participate

The research “Challenges in Facilitating Online Teaching for Secondary Education during the Covid- 19 Pandemic, based on a case study in Sri Lanka” was approved by the Ethics Review Committee of the Sri Lanka Institute of Information Technology in accordance with the Ethics Policy Framework drafted by the Committee. The research was done adhering with ethical considerations and principles guaranteeing anonymity and citing all the work used as reference. The respondents were informed that this research would be done for academic purposes.

Consent for publication

Not applicable

Availability of data and material

All data analyzed during this study are included in this published article and its supplementary information files.

Competing interests

No potential conflict of interest

Funding

The study did not receive any funding

Authors' contributions

The author Arosha de Silva confirms sole responsibility for the following: study conception and design, data collection, analysis and interpretation of results, and manuscript preparation.

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Authors' information

Arosha de Silva is an ICT and computer science teacher and has a Master's degree in Information systems from the Sri Lanka Institute of Information Technology in 2021 and a Bachelor's degree in Education from the Open University Malaysia in 2017. Her current research interests include the adaption of technology in education, online education and ICT training and development for teachers.

Tables

Tables are available in the Supplementary Files section.

Figures

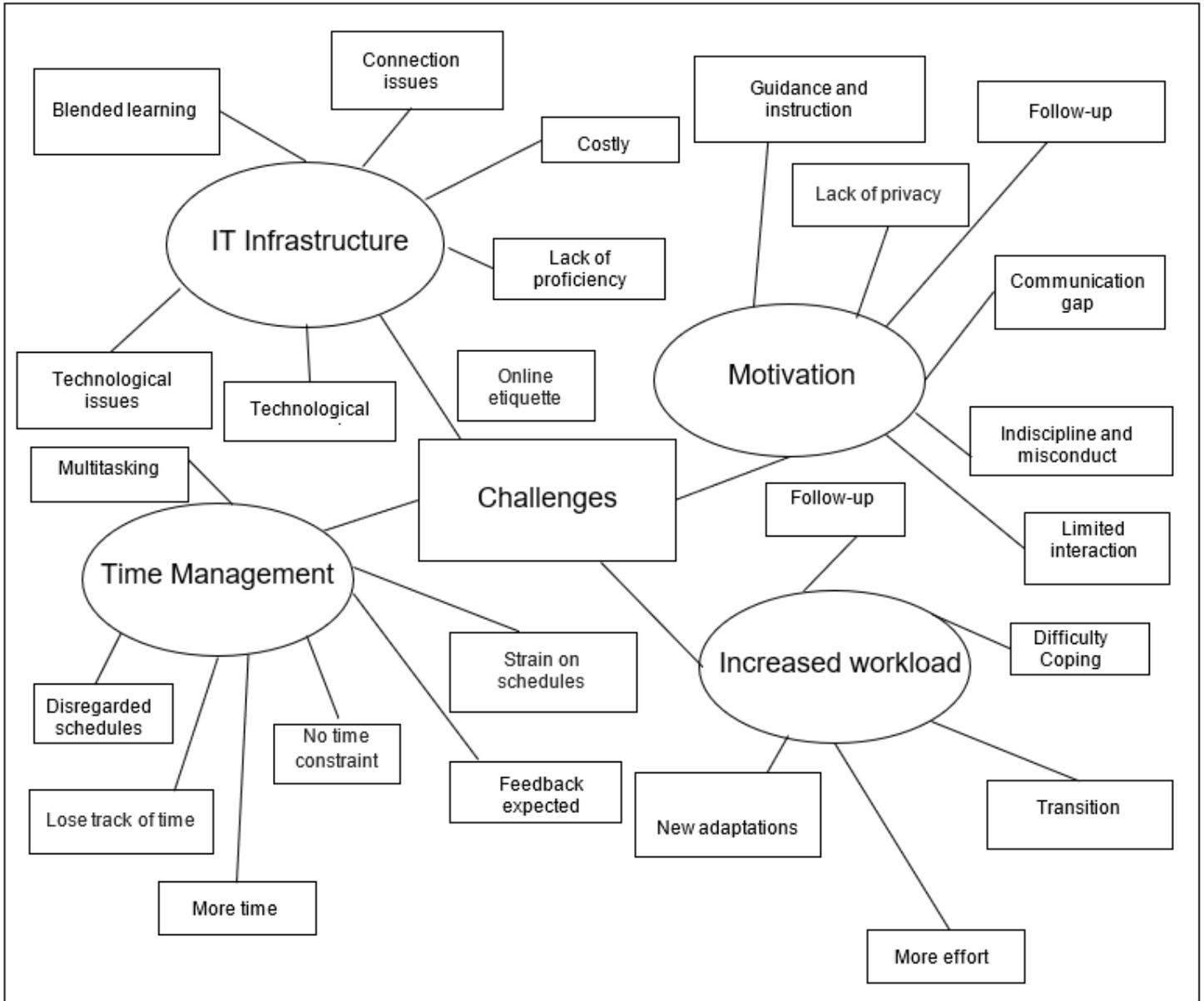


Figure 1

Figure 3 Thematic Analysis Map

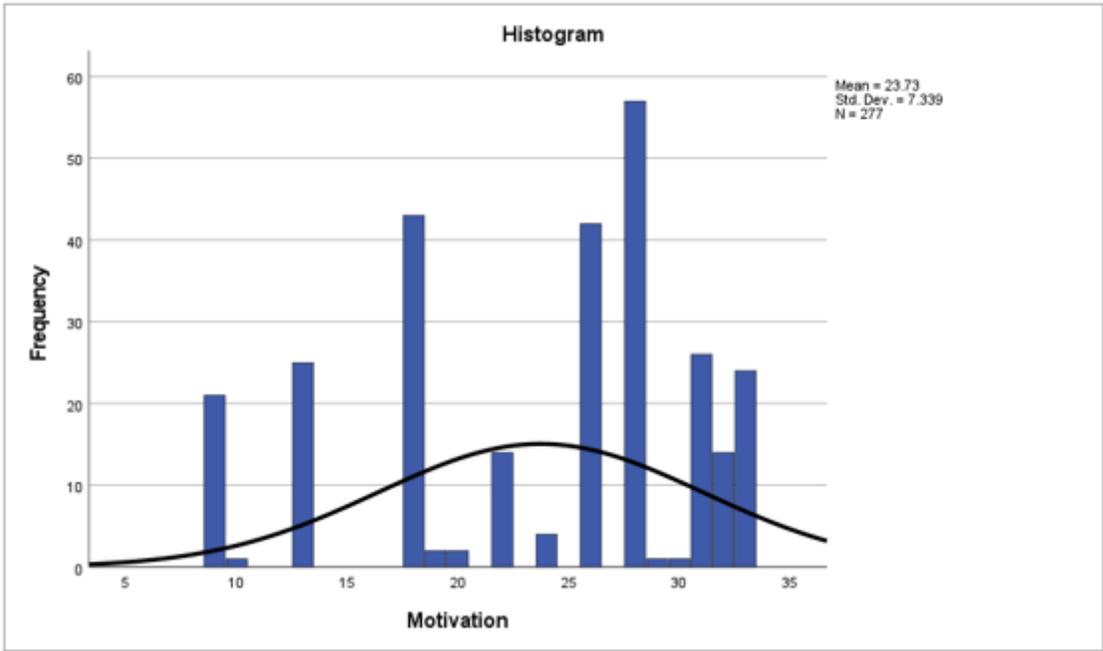


Figure 2

Figure 3.1 Motivation Histogram

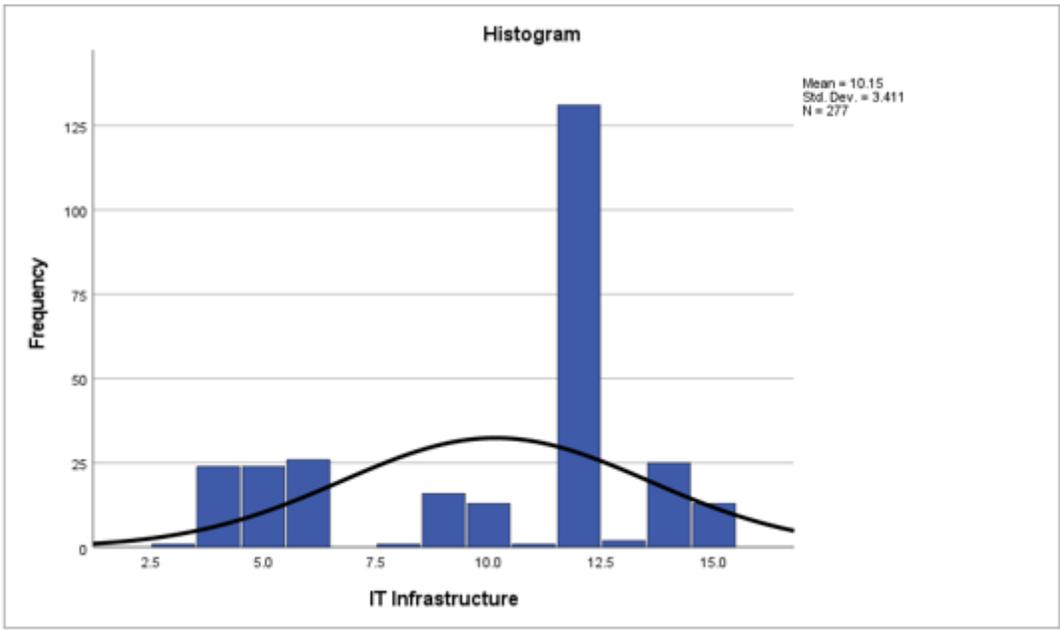


Figure 3

Figure 3.2 IT Infrastructure Histogram

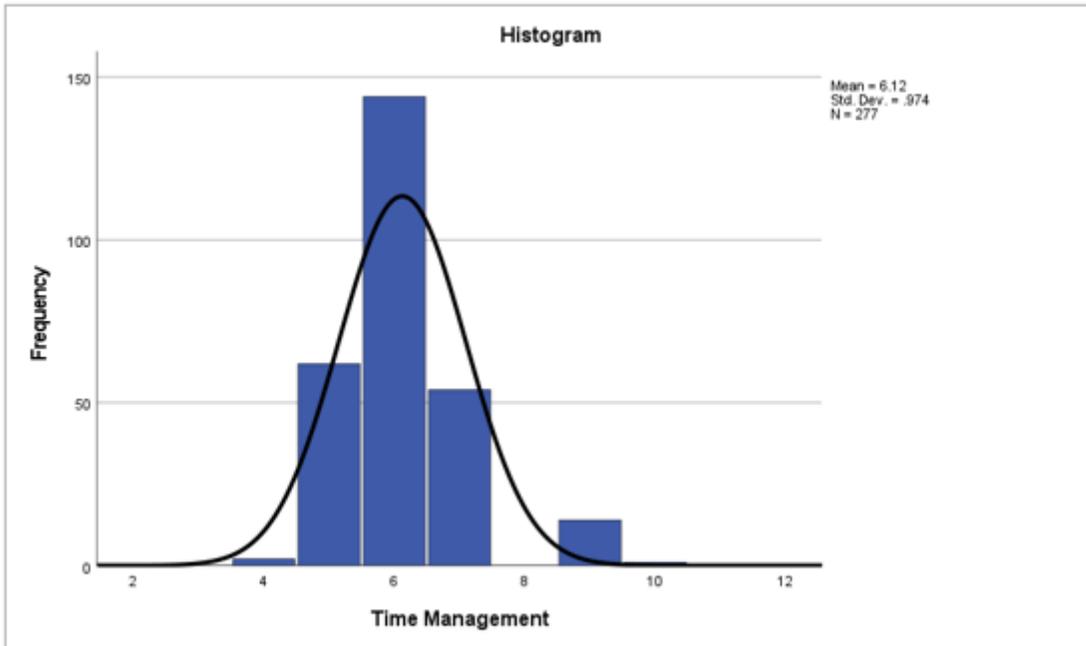


Figure 4

Figure 3.3 Time Management Histogram

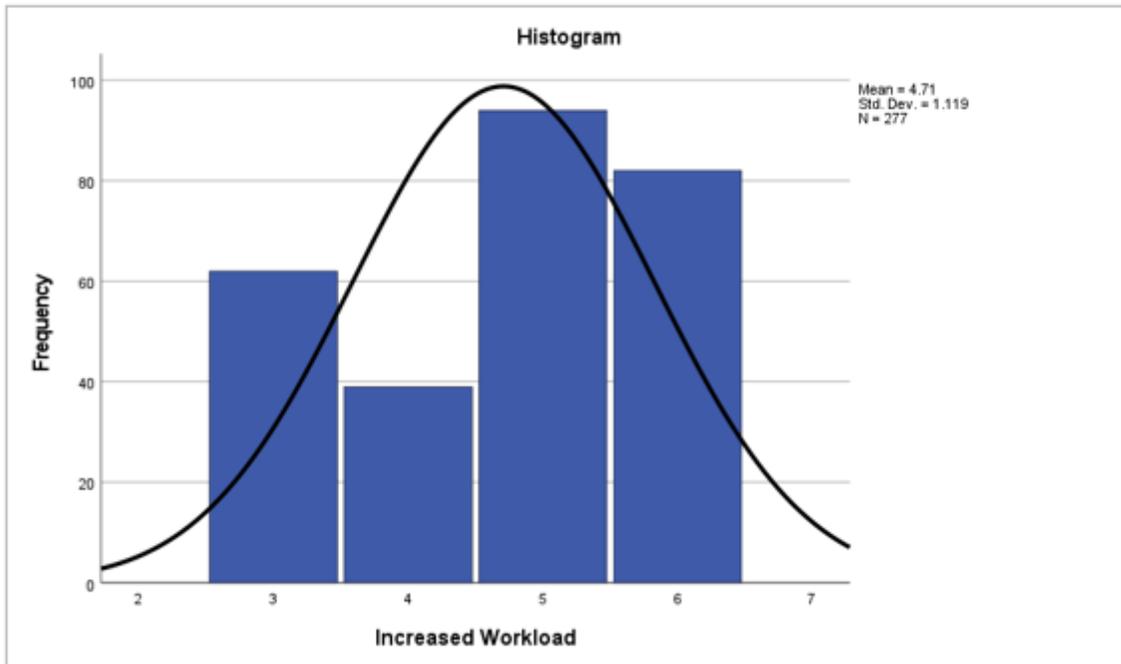


Figure 5

Figure 3.4 Increased Workload Histogram

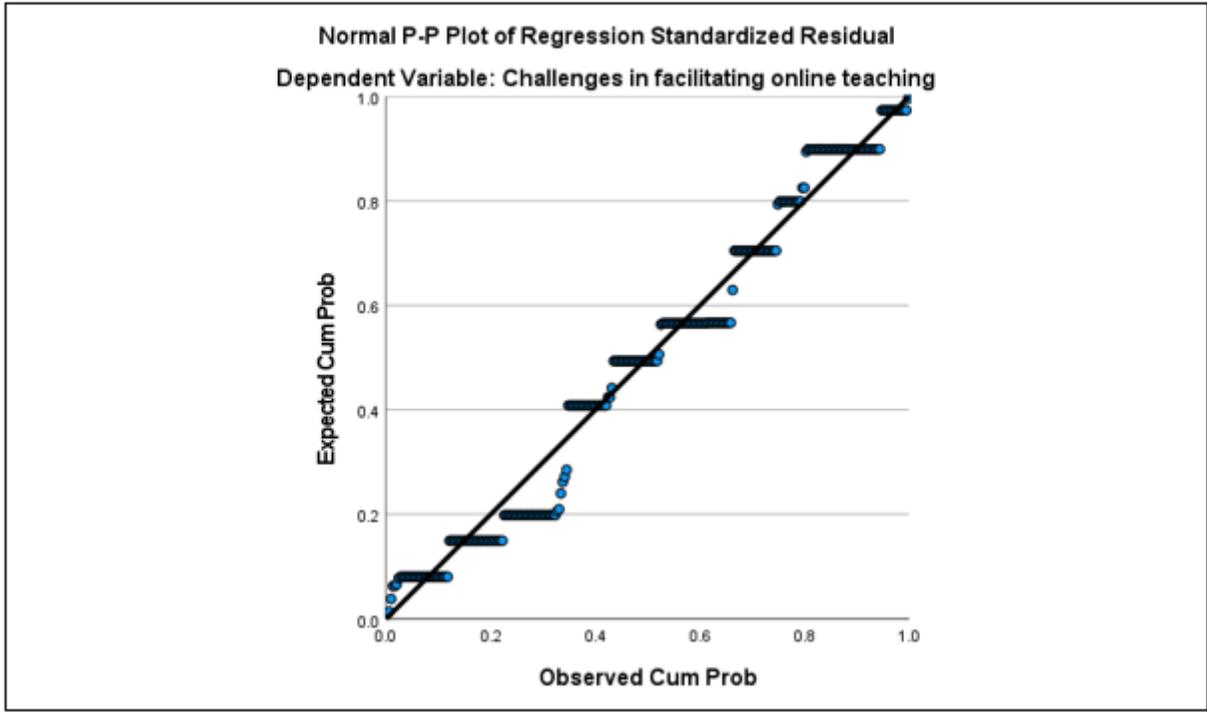


Figure 6

Figure 3.5 P-P Plot

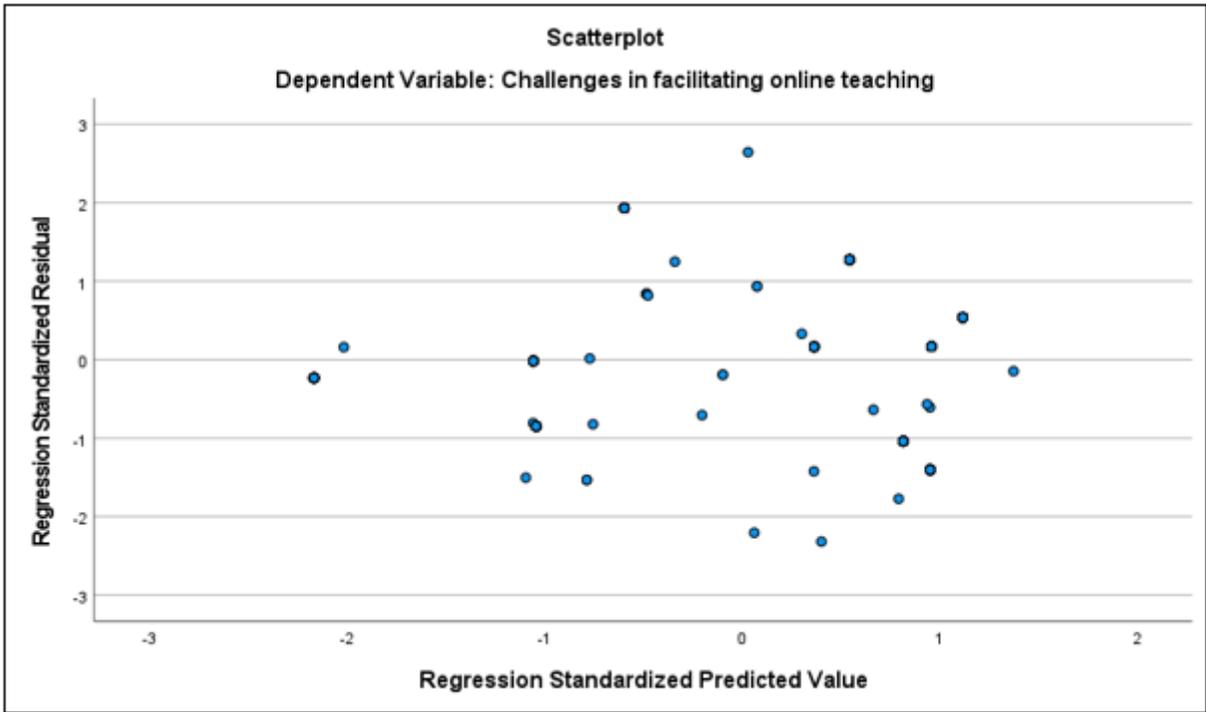


Figure 7

Figure 3.6 Scatterplot

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Tables.docx](#)
- [Questionnaire.docx](#)