Predicting Satisfaction among the Students on E-learning Under the Pandemic Situation

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***Abstract* — E-Learning has become the main medium of education during the Covid-19 pandemic for most of the students, regardless of their age. Hence, there is an undeniable requirement to measure the quality of education students receive and the level of satisfaction students feel about the e-learning they receive under these special circumstances. Among the students of different age groups, university undergraduates were selected as the subjects of this study. There are numerous factors that might affect the feeling of satisfaction about e-learning. For this study, factors related to students' learning environment, learning facilities, teaching styles of the lecturer, examination conduction, student interaction with the teacher and other students, and students' preference on e-learning versus in premises learning was considered. Based on the replies collected from the survey, there were interesting correlations between some factors. They will be discussed in the following research.**

Keywords—e-learning, satisfaction, student, lecturer

I. INTRODUCTION

A formal definition for e-learning can be given as "A learning system based on formalized teaching but with the help of electronic resources". E-learning is a topic that has been on the talk for a long time. However, with the current pandemic situation, the importance of e-learning systems are highlighted compared to normal times. It has become the education medium for children all around the world. So, predicting the satisfaction of e-learning is of utmost importance as the quality of education of a generation depends on e-learning.

Factors that can be used to measure the quality of education can be varied based on the subject area, remote learning facilities, students' age group, familiarity with relevant technologies etc. So, in order to define a scope of this research and get sensible and trustworthy responses, only the university undergraduates were targeted during the data collection stage. Therefore, when preparing the questionnaire for this research, the major factors that might affect the satisfaction of university students were considered. Those factors will be discussed in detail later in this paper.

This questionnaire was distributed only among state university students in Sri Lanka who had been receiving online education during the period of Covid-19 pandemic. There were 165 total responses from students of 8 different universities. The questionnaire was distributed as an online survey and Google forms were used to prepare the questions. This was a voluntary survey and no personal details were collected. Furthermore, participants were aware of the purpose of the data collection and this was conducted with their full consent. The question answering methods were decided considering the convenience of the participants. So, it only included multiple choice questions, dropdowns, and linear scale questions.

When analysing the collected data, there were some interesting patterns and correlations among considered factors. Based on these results, the relevant authorities can take necessary actions to improve the quality of online education and improvise e-learning to meet the satisfaction of the relevant parties.

II. METHODOLOGY

A list of major factors that might affect the quality of e-learning was listed down and a questionnaire was created using Google forms based on the collected facts. This was distributed among state university students with the help of my colleagues and students of those universities. The participants were voluntary and had their full consent for the survey.

A. Questionnaire

The questionnaire consists of questions on main factors like students' learning environment, learning facilities, teaching styles of the lecturer, examination conduction, student interaction with the teacher and other students, and students' preference on e-learning versus in premises learning. These were identified as the facts that might affect the quality of online education university undergraduate receives during this pandemic. More importantly there were no questions related to the students' personal information.

1. Gender of the student
2. Residential area

   A dropdown with the districts in Sri Lanka was provided to select the answer.

3. Monthly income of the family

   A linear scale with 5 different income categories was provided to select the applicable category

4. On what level does the student have access to the required technical devices for e-learning?

   A linear scale was provided to select the answer with 1 being no access and 5 being having enough access

5. Who is the internet service provider?

A dropdown of internet providers in Sri Lanka was provided for the convenient of the student and advised to select the most frequently used one

6. The level of satisfaction about the internet connection

   A linear scale was provided to select the answer with 1 being least satisfied and 5 being most satisfied

7. The university of the student

   A dropdown with the list of state universities in Sri Lanka was given

8. The academic year of the student

   A multiple choice question with up to 5th year

9. The field of education

   A dropdown with major fields of education was provided

10. The duration student has been using e-learning

    Four categories were provided to select the applicable one

11. The number of hours per week the student spend on lectures

    The number of hours spent was categorized into 5 groups

12. The level of interaction with the lecturers during the class

    A linear scale was provided with 1 being does not interact and 5 being interact frequently

13. The level of satisfaction with the quality of teaching

    A linear scale was provided with 1 being least satisfied and 5 being most satisfied

14. The level of satisfaction regarding online exams and assignments

    A linear scale was provided with 1 being least satisfied and 5 being most satisfied

15. The level of satisfaction with the time they are getting during the exams and online assignments

    A linear scale was provided with 1 being least satisfied and 5 being most satisfied

16. The level of satisfaction of lab lessons/practical lessons

    A linear scale was provided with 1 being least satisfied and 5 being most satisfied

17. The level of satisfaction with the interactions with the batch mates

    A linear scale was provided with 1 being least satisfied and 5 being most satisfied

18. The level of engagement with extra-curricular activities that the university conducts

    A linear scale was provided with 1 being does not engage and 5 being frequently engage

19. How distracted the student gets during online lessons (Eg: Due to loss of internet connection, background noise etc.)

    A linear scale was provided with 1 being rarely distracted and 5 being frequently distracted

20. How much they prefer e-learning over in-premises learning

    A linear scale was provided with 1 being prefer in-premises learning the most and 5 being prefer e-learning the most

B. Data

Total of 165 responses were collected from the online survey and they were from 8 different state universities. The data was collected to an Excel sheet and they were further analyzed.

III. RESULTS

Following graphs are the representations of the collected data and they demonstrate different aspects that have an impact on e-learning.

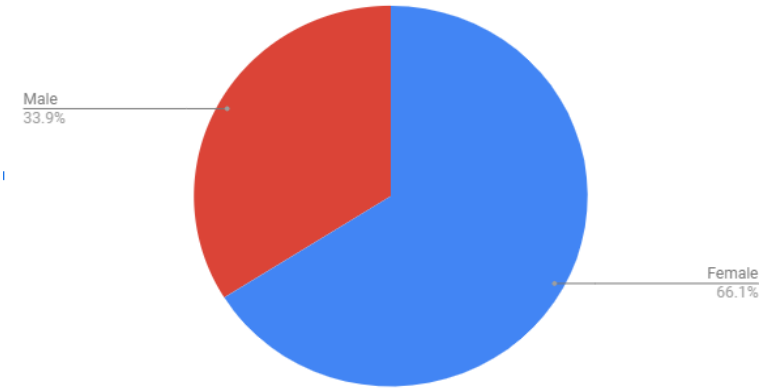


Fig1: Gender wise distribution of the participants

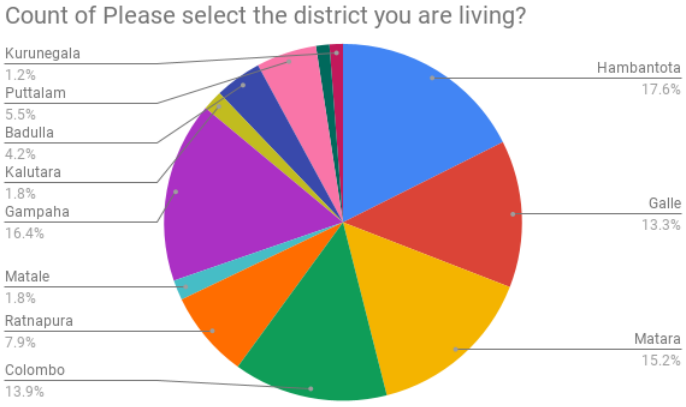


Fig2: District wise distribution of the participants

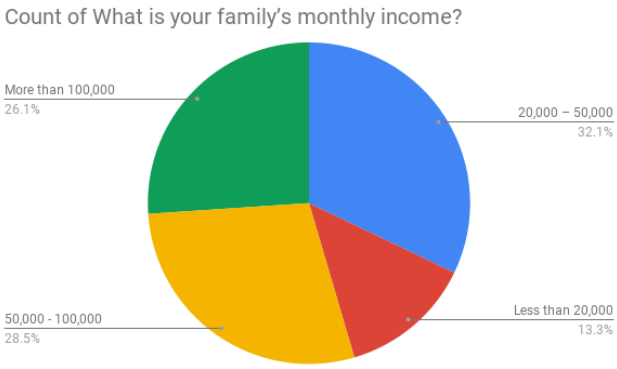


Fig 3: Income distribution of the participants

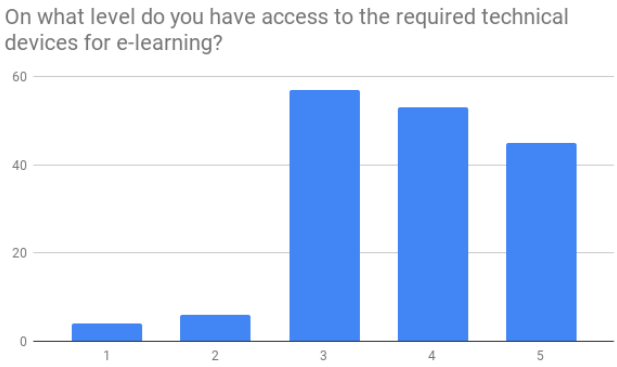


Fig 4: Accessibility to technical devices

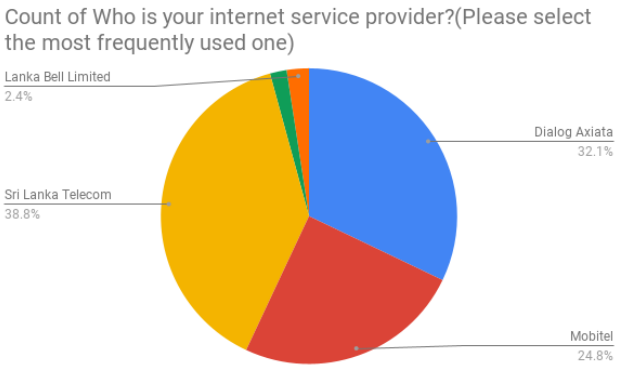


Fig 5: Internet Service Providers

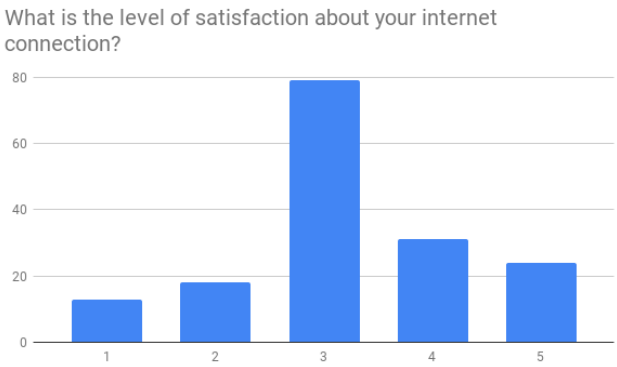


Fig 6: Level of Satisfaction regarding the internet connection

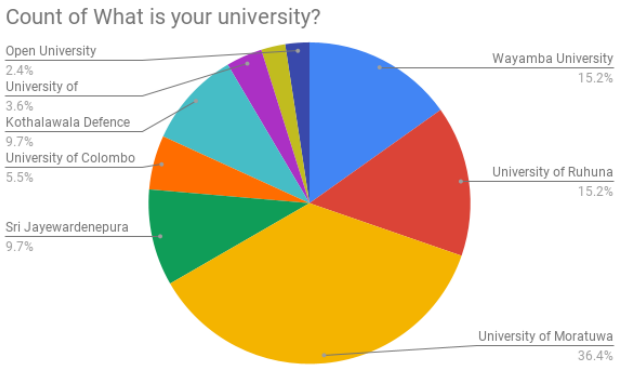


Fig 7: Student distribution among universities

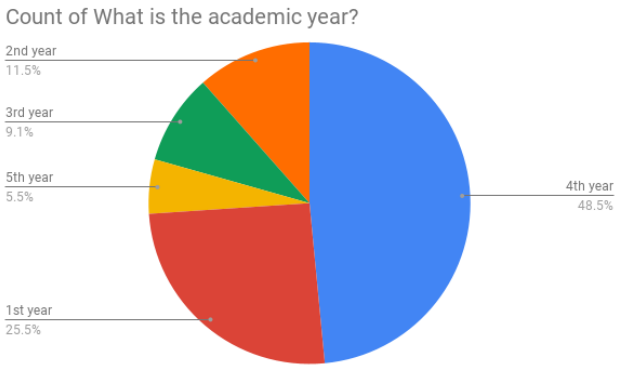


Fig 8 : Academic year of the students

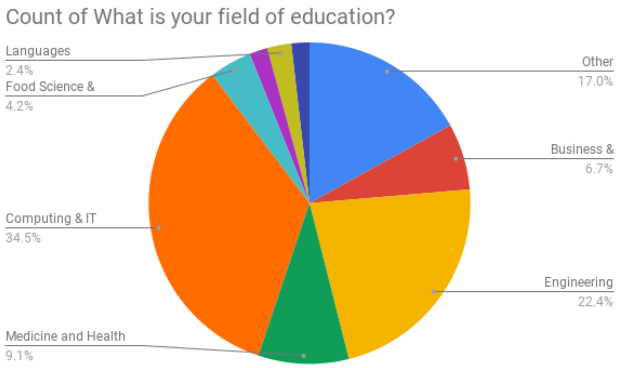


Fig 9: Field of studies

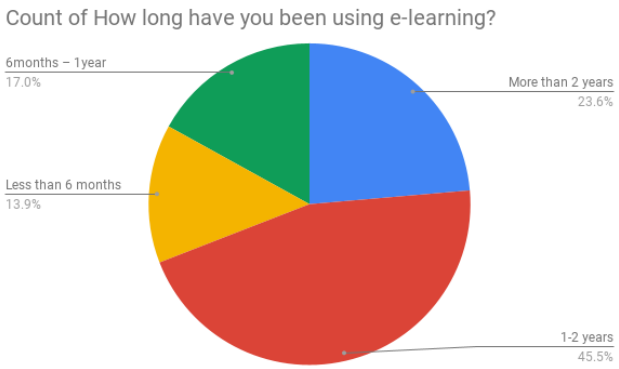


Fig 10: Duration of e-learning

Fig 11: Hours per week spent on e-learning

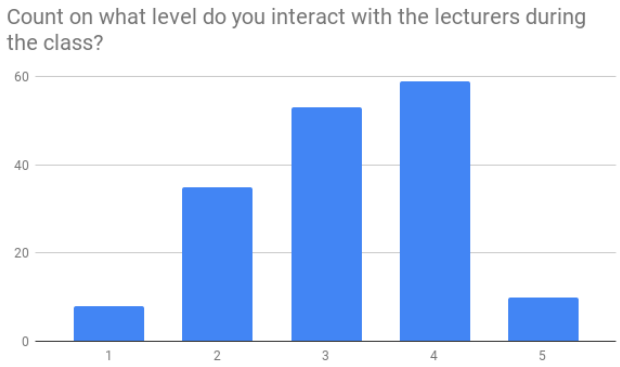


Fig 12: Interact with lecturers during the e-learning session

Fig 13: Students' satisfaction on quality of teaching

Fig 14: Satisfaction on online conducted exams

Fig 15: Satisfaction on time allocation for assignments and online exams

Fig 16: Satisfaction on online lab lessons

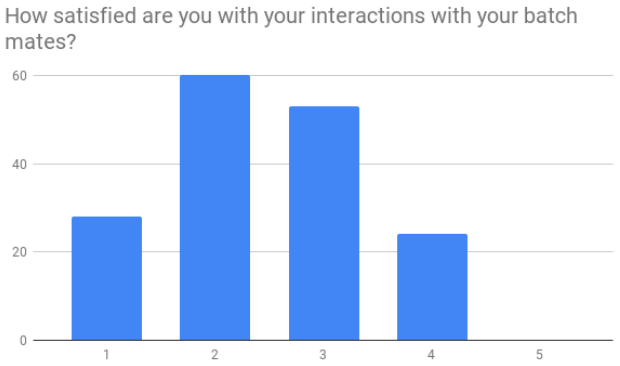


Fig 17: Levels of satisfaction regarding the interaction with the batch mates

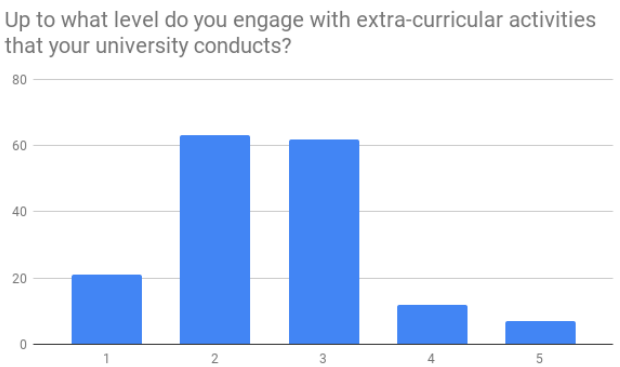


Fig 18: Level of engagement for extracurricular activities

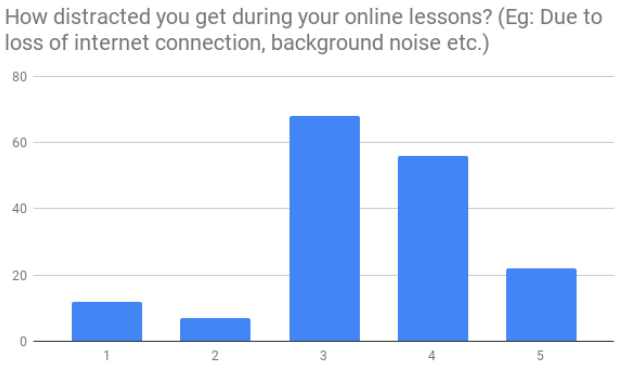


Fig 19: Level of distraction student face during e-learning

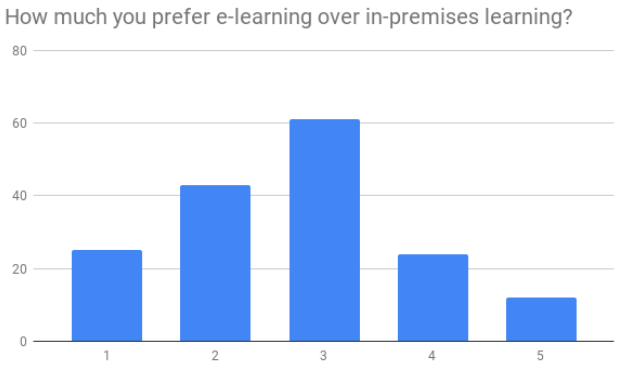


Fig 20: Favouaration for e-learning over in-premises learning

IV. ANALYSIS

When analyzing the results and observed graphs there can be found interesting patterns and correlation among different factors. Among those things this research focused on checking the correlation between the level of students' engagement in extracurricular activities and the level of satisfaction of e-learning that the students receive.

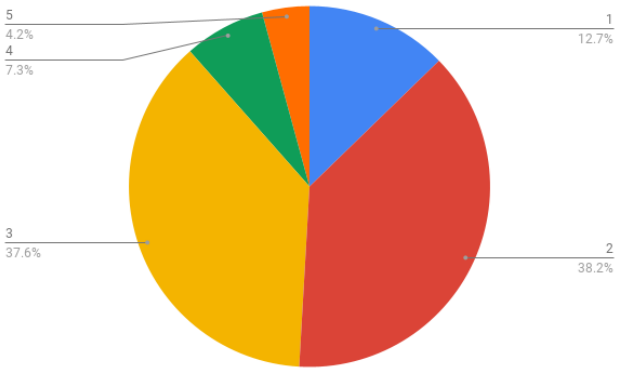


Fig 21: Level of Student Engagement with Extracurricular Activities

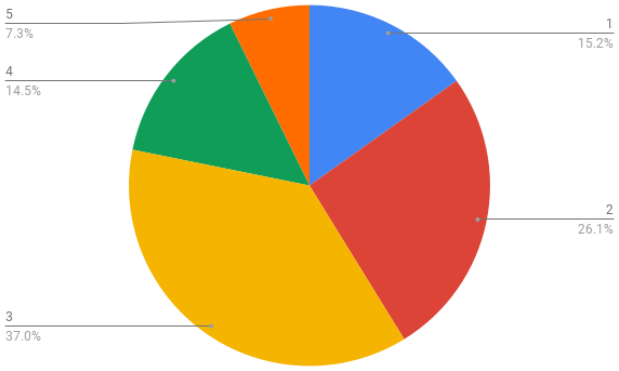


Fig 22: Level of Student Favouration for E-learning over In-premises learning

A. *Hypothesis Testing*

Following hypothesis testing was conducted to check is dissatisfaction towards e-learning not caused by students' levels of engagement in extracurricular activities that the university conducts.

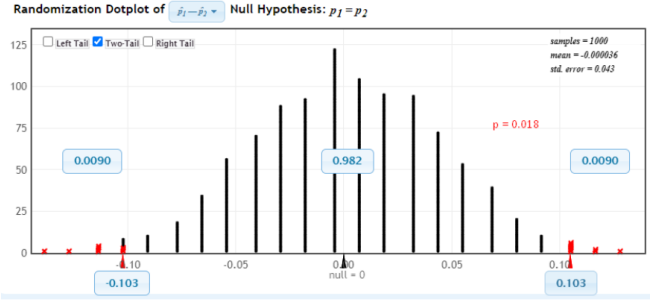
p_a - proportion of students engaged in extracurricular activities to a unsatisfactory level = 0.885

p_e - proportion of students dissatisfied with e-learning over in-premises learning = 0.782

Null hypothesis - H_0 : $p_a = p_e$

Alternative hypothesis - H_a : $pa \neq pe$

$p_a - p_e = 0.103$



Original Sample

Group	Count	Sample Size	Proportion
Group 1	146	165	0.885
Group 2	129	165	0.782
Group 1-Group 2	17	n/a	0.103

Randomization Sample

Group	Count	Sample Size	Proportion
Group 1	143	165	0.867
Group 2	132	165	0.800
Group 1-Group 2	11	n/a	0.067

Fig 23: Randomization dotplot of the null hypothesis pa = pe [1]

Based on the randomization dotplot in Fig: 23, p value is 0.018, which is less than 0.05 significance level. Therefore,

we can reject the null hypothesis and it proves that our alternative hypothesis is correct. Hence, it is concluded that satisfaction towards e-learning depends on the level of student engagement in extracurricular activities conducted by the university.

V. Conclusion

This research was conducted to predict the satisfaction among students on E-learning under the Covid-19 pandemic. The student satisfaction might depend on several reasons. Based on the results observed from the data analysis done on conducted online survey responses, we were able to identify a correlation between student satisfaction and the level of engagement in extracurricular activities. According to the results of the hypothesis test, it is concluded that satisfaction towards e-learning depends on the level of student engagement in extracurricular activities conducted by the university.

Git Repo -

https://github.com/NadeeshaPathirana/ELearningSatisfaction

References

[1] "StatKey," [Online]. Available: https://www.lock5stat.com/StatKey/