Satisfaction among the students on E-learning during Covid-19 pandemic situation

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Abstract - **Because to COVID-19, online learning has become the new standard in many educational systems across the globe. Online learning satisfaction is an important factor in supporting effective educational processes. The purpose of this research was to find out how satisfied students were with the E-learning during the current Covid-19 pandemic situation. The goal of this article was to uncover the fundamental aspects that influence and decide student satisfaction with e-learning. For this investigation, a survey was used as the approach. A 32-item questionnaire was used to gauge the satisfaction of the pupils. A total of 270 students from various study programs were included in the present research's sample. To assess students' satisfaction with the system, descriptive statistics, regression analysis, and one sample t-test were used. Students neutrally favor this approach because of its high teaching standards, according to the findings. Interactivity pattern was identified as a significant measure of overall system satisfaction by regression analysis. Students were neutrally happy with the e-learning system, according to a sample t-test. According to the findings, unorthodox learning is just as effective as traditional learning. The study's findings have practical consequences, pointing to the necessity for face-to-face contact and improved engagement patterns between instructors and students in order to improve students' satisfaction with the system.**

Index Terms – Student satisfaction. E-learning, Interactive learning, Case study
Github link - https://github.com/senzNirojan/Satisfaction-among-the-students-on-E-learning.git
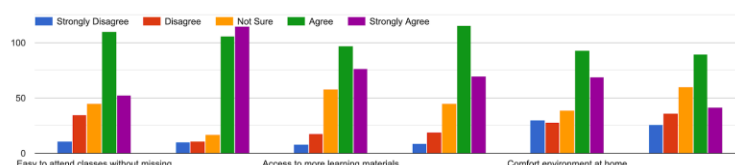
I. INTRODUCTION

Our desired thinking has become a reality as a result of the modern revolution in information technology. It benefits individuals from all walks of life by making communication quick and unrestricted by geographical restrictions. The advent of information technology has also created new opportunities in the education industry. It has surely imbued the traditional idea of distant learning with a fresh energy. These communication devices have steered us toward a new kind of education, namely e-learning. Now, education is accessible to all students, whether they are full-time or part-time. E-learning enables students to study from any location, at any time, and at their own speed. During the Covid-19 pandemic situation E-learning becomes a mandatory and compulsory education system to all students across the whole world.

Among the affected industries is higher education, which had one of the most severe interruptions during the lockdown period, despite the fact that most nations attempted to maintain key economic operations. Nonetheless, such activities did not extend to higher education institutions (HEIs), which were closed entirely after the suspension of face-to-face activities in order to prevent the virus from spreading among their students and staff, and ultimately, the general public.

HEIs have, nevertheless, continued to provide instruction via the use of diverse digital media, e-learning platforms, and video conferencing technologies. As a consequence, e-learning has become a required component of the educational process. Many HEIs were also confronting this style of delivery for the first time, making the transfer all the more difficult since there was little time to prepare and adjust to the new educational environment. Today, both instructors and students find themselves in a new environment, with some adjusting more easily than others. This implies that the quality of teaching and learning must be prioritized. The term "e-learning" refers to any modes of instruction and learning that make use of various information and communication technologies (ICTs) during the COVID-19 lockout.
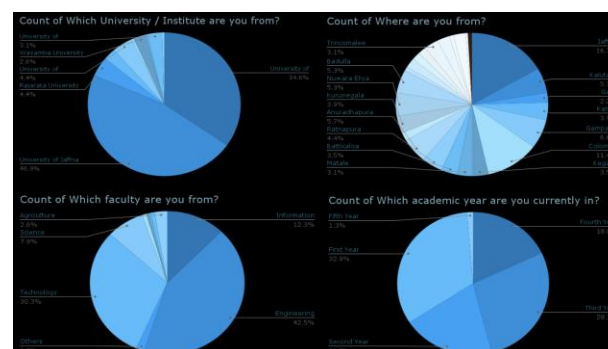
To better understand the impact of COVID-19 on the academic arena, particularly on students' learning effectiveness, we examined the elements that influence how students assess their academic achievement in the absence of onsite classrooms at HEIs. Students' satisfaction in e-learning environments has been studied since the introduction of the new mode of delivery

via ICT, with researchers attempting to identify factors that influence success with the implementation of e-learning systems, but little attention has been paid to this topic in the current pandemic context. Thus, the purpose of this research is to close this gap by examining students' e-learning experiences during this emergency shift. Therefore, the questions we address questions in this paper are

1. Benefits of e-learning you feel compared to in-class learning?
2. Strategies you like on Online Teaching?
3. Generic skills and learning experience in E-Learning
4. Technical challenges you face on E-Learning?
5. Personal challenges you face on E-Learning?
6. Course related challenges you face on E-Learning?

II. THE COVID-19 PANDEMIC AND E-LEARNING

The suspension of school and university courses due to the pandemic has impacted nearly 1.5 billion students and young people throughout the world, according to the International Association of Universities (IAU). As a result, governments have had to depend heavily on the e-learning modality, which may be described as learning experiences facilitated by internet technology, to preserve learning continuity while striving to limit the epidemic. Most HEIs, on the other hand, were unable to cope successfully with the rapid shift from on-site classrooms to on-line platforms, either owing to a lack of infrastructure or a lack of appropriate pedagogic initiatives. Many research investigations have been conducted across the globe to better understand the mechanism and extent of COVID-19's effects.

What are the course related challenges you faces on E-Learning?
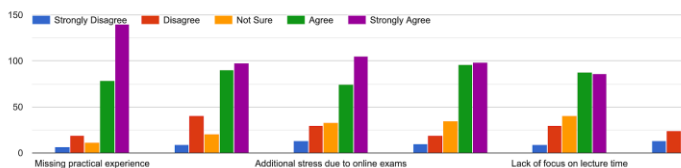
Before COVID-19, numerous e-learning modalities such as blended learning and massive open online courses were steadily expanding over the globe as new technologies were created over the previous several decades. As a result, e-learning was founded on careful planning and instructional design based on existing ideas and models. It's worth noting right away that what many HEIs deployed during the epidemic isn't really e-learning; it's emergency remote teaching, which isn't always as efficient and successful as a well-established and strategically managed system. Even yet, online systems like as MS Teams, Moodle, Google Classroom, and Blackboard are used all over the globe. Although e-learning provides some academic continuity, technical education has suffered doubly since social distance requirements have interrupted the implementation of both practical and work-based learning activities, which are crucial for educational achievement.

While students have been mainly content with how they have transitioned to e-learning, they have missed lectures and personal contact with their lecturers, according to Puljak et al. They said that e-learning could not replace traditional learning experiences, and that only 18.9% of students were interested in e-learning as a long-term solution. It has been stated that instructors and students are not prepared to transfer from face-to-face instruction to a digital platform.

The closure of colleges and schools as a result of the COVID-19 epidemic has had a number of negative implications for pupils, including disrupted learning and less opportunity for students to grow and develop. This adjustment has caused psychological changes in both students and instructors and has had a significant impact on their performance. Tutoring in higher education is a well-established paradigm of assistance, counsel, and guidance for students in higher education with the goal of increasing motivation and preventing dropout. During the Covid-19 epidemic, Pérez-Jorge et al. investigated the efficiency of the university tutoring system. The relationship between the tutor and the student is built on cooperation and communication, which necessitated fast adapting to changing conditions while using various communication technologies. In-person tutoring, e-mail tutoring, virtual tutoring (Hangout/Google Meet), and WhatsApp tutoring were all investigated. They stated that synchronous models and frequent daily communication are necessary for an effective and successful tutoring system, and that the WhatsApp application, which allows for synchronous communication via messages and video calls, is the form with which students are most satisfied and benefit the most.

The purpose of moving teaching and learning to online platforms is to lower the number of in-person encounters and hence the danger of COVID-19 transmission by physical touch. In addition, the manner of engagement has shifted from offline to online. Students communicate with one another through online platforms for small groups as well as bigger groups. Many clinical skills are learnt via direct encounters with patients and caregivers, which is one area where the shift to e-learning platforms has had a negative impact.

III. STUDENT SATISFACTION WITH E-LEARNING

Student satisfaction has been found to be an accurate indicator of the performance of ICT-based activities in e-learning settings. Scholars have shown a substantial link between students' perceptions of their academic success and their satisfaction with their e-learning settings.

Online interactions, computer efficiency, online skills, teacher support, course design, teacher feedback, quality of information and activity, and technical support are all important antecedents to students' satisfaction with e-learning training. Environmental factors including as temperature, lighting, and noise were discovered as key predictors of students' e-learning effectiveness during the COVID-19 pandemic.

Sun et al. look at the impact of overall quality–as a holistic construct–on e-learning system satisfaction. Learners (mental health, self-efficacy, and attitude of the learner), teachers/instructors (attitude and response timelines assigned by the teacher), technology (quality of technology and the Internet), curriculum (quality and flexibility of the curriculum), design (usefulness and complexity of the design), and environment are all quality factors that facilitate e-learning (interactiveness and assessment diversity). Since e-learning necessitates not only physical equipment such as computers, servers, learning and communication platforms, but also software programs, operating systems, and professionals in the usage of these technologies, this epidemic has posed a challenge to HEIs all over the globe. Teachers, on the other hand, must have significant digital skills in order to utilize ICT successfully in the classroom.
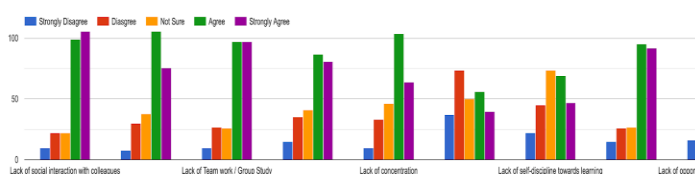

How online education is done is one of the most important aspects in e-learning implementation success. Receiving timely feedback, professors' attempts to be organized, providing online lectures (and recording them), adjusting instructions to this learning paradigm, and assisting students in following the courses and seeking feedback on their experiences are all examples of this. In certain situations, students have not been properly advised to follow their courses, have been overburdened with too many tasks, and there has been widespread criticism about the absence or loss of practical training, which has therefore not been fully addressed in their e-learning experiences.

Timely feedback and answers to students' activities, according to Chopra et al, are essential for efficient online delivery. Another research discovered a favorable link between e-service and information quality and student satisfaction. Almaiah et al, based on interviews with Jordanian teachers and students, discovered that it is critical to examine students' and teachers' use and adoption of systems, with key challenges including: change management, students' and teachers' resistance, as many prefer traditional learning, ICT literacy, students' self-efficacy and motivation, and technical issues related to system accessibility, availability, usability, reliability, and personalization. Perceived ease of use effects both system adoption and perceived usefulness, and it was definitely an essential factor since many participants complained that the e-learning system they were using was neither simple to use nor adaptable, which impacted their technical concerns. When instruction migrated to online platforms, Indian research found a decrease in teacher–student contact. As a result, for successful learning, students must have more autonomy, as well as self-regulation and online learning abilities.
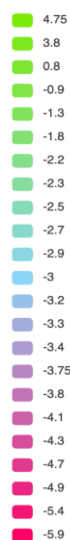
However, students' computer skills and knowledge of various learning platforms have a significant impact on their willingness to participate in e-learning. Wu et al. also point to a lack of basic computer skills as a major barrier to efficient online distribution. It's worth noting that e-learning might be hampered not just by a lack of soft skills, but also by a lack of suitable technology. Based on the replies of 42 Hungarian HEIs, the Hungarian Rectors' Conference concluded that e-learning experiences were usually good. The primary concerns, however, were a lack of technical preparation and equipment; many students, in particular, lacked proper equipment or Internet connection. Students in affluent nations were also observed to be more satisfied with e-learning than their counterparts in poor countries. Similarly, resource-constrained environments face challenges such as a lack of digital platforms for education, restricted Internet access, slow Internet speeds, expensive Internet costs, and insufficient competence to operate with digital platforms. Because of a lack of technological infrastructure for e-learning such as computers, connectivity, and electricity, as well as deficient skills and active participation of both students and teachers due to insufficient ICT literacy, infrastructure resources in developing countries are incomparable to those in developed countries.

The following tactics have been identified as effective for improving e-learning:

1. To use a broad range of learning techniques.
2. Use technologies that enable students to gain knowledge, debate, co-construct, and engage with information collectively.
3. Incorporating social media with e-learning to provide a more suitable and interesting learning environment.
4. Using flexible and scaffolded online resources to learn new technical abilities that might be relevant for future employment prospects.

5. To offer e-learning with suitable technical infrastructure and equipment.

IV. CONCEPTUAL MODEL AND RESEARCH HYPOTHESIS

This study proposes a conceptual model for analyzing students' satisfaction on E-learning during the period of the COVID-19 pandemic, which forced the transition from on-site to on-line teaching and learning. In this research, we combine the benefits, strategies, generic skills and learning and challenges from the E-learning when compared to the traditional learning processes. Six factors associated with students' satisfaction corresponding to the learner dimension are included in our proposed model. First factor regarding the benefits from the E-learning when compared to on-site learning. This includes Easy to attend classes without missing, Ability to record lecture, Access to more learning materials, Learning on your own pace and Comfort environment at home. Second factor which included in the proposed model is Strategies you like on E-learning. As like previous example this study also includes multiple features to predict the satisfaction among students. Interactive Discussions with the pre-uploaded record Lectures, Lectures with in-class quizzes, Online team activities through breakout rooms, Video based teaching, Online teaching with polls and recorded videos are some of those features.

Generic skills and learning experience in E-Learning is followed by previous two factors to ensure satisfaction among student on their generic skills such as problem-solving skills, work as a team member, confident about tackling unfamiliar problems and achieving the goals. Then in next part is about the challenges in E-learning when compared to the traditional learning processes. This majorly includes three main factors such as technical challenges, personal challenges and course related challenges. From the factors we considered and from collected data It leads us to derive multiple hypothesis.

1. Quality of E-learning when compared to traditional learning have positive impact on students' satisfaction on E-learning.
2. Traditional learning facilities have impact on students' satisfaction on E-learning.
3. Different type of strategies in E-learning have positive effect in satisfaction.
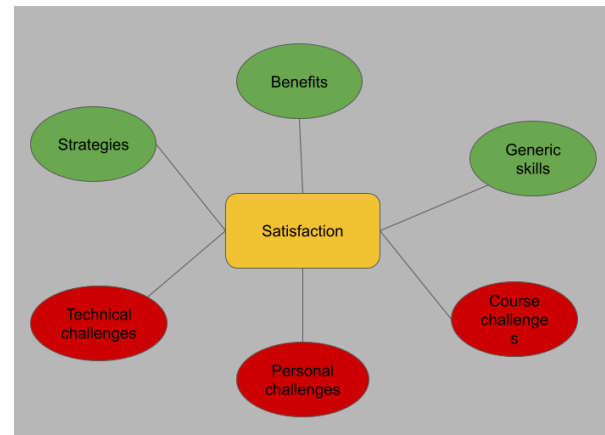
V. MATERIAL AND METHODS

1. Design and Procedure

The data for this research came from a large-scale Island wide student survey titled " Predicting satisfaction among the students on e-learning under the pandemic situation" which looked at how students' satisfaction varies with pandemic situation in Sri Lanka. This initiative was initiated by the Faculty of Engineering Department of Computer Science and Engineering at the University of Moratuwa. And It's initiated by the senior lecturer DR. UTHAYASANKER THAYASIVAM (PhD (U. Georgia), BSc Eng. (Hons) (Moratuwa)) for a course module called Statistical Inference in Masters of Data Science degree. The online poll was developed and expanded from a survey. It was made up of 47 questions. It focused on socio-demographic, geographic, and other areas of university students' lives and benefits, strategies and challenges from E-learning during COVID-19. The online survey was conducted in English. The online-based survey was started on 17th October 2021 using the google forms and remained available until 27th November 2021. Totally we got 270 responses within the period across all districts from Sri Lanka.

Gender	Satisfaction score	Satisfaction percentage
Matale	-5.9	37.70
Mannar	-5.4	38.75
Galle	-4.9	39.79
Nuwara Eliya	-4.9	39.79
Puttalam	-4.7	40.20833333
Ampara	-4.3	41.04166667
Badulla	-4.1	41.45833333
Mahanuvara	-3.8	42.08333333
Batticaloa	-3.75	42.1875
Hambantota	-3.4	42.91666667
Vavuniya	-3.3	43.125
Mulativ	-3.2	43.33333333
Trincomalee	-3	43.75
Jaffna	-2.9	43.95833333
Colombo	-2.7	44.375
Kurunegala	-2.5	44.79166667
Matara	-2.3	45.20833333
Kægalla	-2.2	45.41666667

Ratnapura	-1.8	46.25
Kalutara	-1.3	47.29166667
Polonnaruwa	-1.3	47.29166667
Gampaha	-0.9	48.125
Anuradhapura	0.8	51.66666667
Moneragala	3.8	57.91666667
Kilinochchi	4.75	59.89583333

2. Participants

The poll was designed for all higher education students who were at least 18 years old, which was the study's target group. Non-probabilistic sampling was employed, especially convenience sampling using university communication networks across the globe and social media. Before participation, the students were told about the study's specifics and granted their informed permission. There were 270 participants or students registered at HEIs in the final dataset, with 87 percent of them engaged in a full-time study course. They were at least 18 years old, with an age range of 21 to 26 years, and about two-thirds (67 percent) of them were male. University of Jaffna has 46 percent, University of Moratuwa has 34 percent, and University of Colombo has 5%. Sri Lankan data was obtained from all districts. Colombo district accounts for 11.4 percent, Kalutara for 5.7 percent, and Nuwara Eliya for 5.3 percent. Table 1 provides detailed information about the sample, including the number of respondents and sociodemographic characteristics of participants per nation.

Gender	Satisfaction
Male	39.4 %
Female	45.6 %
Better Not Mentioned	50.2 %

3. Data Analysis

After collected the data descriptive analysis, regression testing and T-test were applied for statistics. Added 1-5 scores for each response from the students for each factor we considered. Added weight for each factor we considered 1 for benefits from e-learning, 0.5 for strategies we like in e-learning and general skill and experience in e-learning and -1 for challenges in e-learning. Altogether 30 factors were considered and the total scores vary from -24 to 24. In these score -24 means students really disappointed from e-learning and 24 means students really enjoy the e-learning.

VI. RESULTS

The initial result for overall satisfaction among student is directly asked from students by giving score between 0-10. But this is not a best accurate measurement to calculate the satisfaction score because we don't exactly what are the factors they are considering when giving the score. For example, some students may consider quality as their measurement but some students may consider different methodologies and some other students may consider other geographical factors such time and distance. So, it's not a best practice to get direct score from students to predict the satisfaction score. The mean score calculated from the direct response from 270 students is about 61.5%.

Other than initial score prediction of all responses we got; we have done some descriptive analysis as well. From that we derived that satisfaction level of female is higher than male in E-learning. And when we are compared the score in district vise most of the districts have negative impact or less than 50% satisfaction level while some districts have higher satisfaction percentage. Kilinochi is the district who support or higher satisfaction level among all districts and Matale is lowest one. After the survey we contact some student and ask them the reason behind this; During this mobile conversation we got responses like in Kilinochi they don't have physical or traditional learning facilities as much when compared to others. So, they support or satisfied with the E-learning as they got much resources or facilities from E-learning.

Then we conduct the T-test for the satisfaction level in E-learning among all students with mean average of the sample of 270 students. And got the 95% confidence level as 48% - 52% for satisfaction level among students on E-learning during Covid-19 pandemic situation.
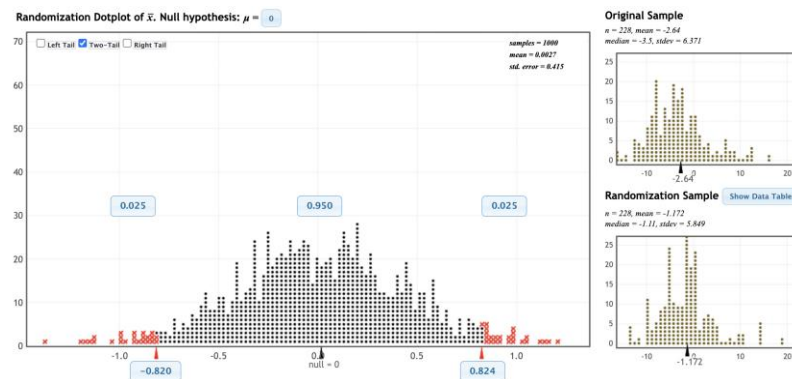
VII. CONCLUSIONS

During the first wave of the COVID-19 epidemic, which drove the switch to online education, our research revealed latent characteristics driving students' perceived academic success. All of the assumptions were verified, and the suggested conceptual model was found to be credible. According to the findings, the quality of e-learning during the first wave of the COVID-19 pandemic was primarily determined by service quality, which included administrative, technical, and learning assistance via tutors and the library, teachers' active role in the process of online education, which included responsiveness and timely feedback, and overall system quality, which included the mode of delivery and IT infrastructure. Students' digital abilities and online contacts with colleagues and professors were shown to be statistically significant but somewhat less

critical elements. Furthermore, our findings suggest that student satisfaction with e-learning has a considerable influence on the effect of e-learning quality and traditional learning facilities on student satisfaction.

VIII. Limitations

There are various limitations to this research that should be noted. First, there's the convenience sampling approach, which restricts the findings' generalizability. The computed findings are based on a sample of students from Sri Lankan universities with government universities taking the lead. It is obvious that the universities vary from government to private when it's comes to the quality of E-learning. Furthermore, students required technological devices and an Internet connection to access the online questionnaire, which might lead to selection bias. Another key disadvantage of this research is the time it took to gather the data. When we conducting this survey almost 2 years gone from first wave of the Covid-19 and everyone adapted to the E-learning. It may give results differ than if we conduct the survey at the start of Covid-19 situation.

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