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Issues and Challenges of e-learning, and Performances of Students During the Covid-19 Pandemic at the Faculty of Fisheries and Marine Sciences & Technology, University of Ruhuna, Sri Lanka

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Abstract

Education systems were interrupted during the last twenty months as conventional teaching was impracticable with Covid-19 pandemic. To overcome this global challenge, “e-learning” was exponentially grown in the education sector. However, Sri Lanka is still at its initial stage adapting to this transition. Similar to most other universities, the Faculty of Fisheries and Marine Sciences & Technology had not been completely prepared for this sudden transition. Hence, e-learning has evolved gradually while confronting various issues and challenges. The present study was designed to investigate those issues and challenges that impede the quality of e-learning. A survey was conducted using two different close ended structured questionnaires, which were circulated among students and academic staff using Google forms. In addition, results of students in the most recent two semesters were analysed to determine the influence of e-learning on pass marks of subjects. Students prefer morning hours from 8.00-12.00 noon for online lectures for a maximum of two hours per lecture, which totally matches to the teacher’s choice. Headaches, blurred vision and dry eyes were associated with prolonged screen time for more than two hours were recorded as the most common causes. Furthermore, continuous usage of electronic devices caused failures in their devices due to heating. Even though video conferencing allows live interaction between students and teachers, the majority of students avoid this option due to internet interruption, and high data usage. However, a major challenge of online teaching was the lower responses of students, where their responses or active participation in discussions were almost zero for certain courses. There was no significant negative

impact of e-learning on pass marks of subjects. Although students prefer both online and conventional teaching, teachers are not satisfied with e-learning. These findings would help to solve issues in e-learning as well as to improve the quality of e-learning of the faculty.

Keywords: Distance-education, Video Conference, Covid-19, E-learning, Assessments

Introduction

e-learning is an active learning process that empowers students allowing better learning experience and enhances co-creation abilities. With the help of available information technology tools, e-learning can be conducted either online or offline. In the learning process, there are three components needed to be considered: teaching, learning and assessments. All of these components can be addressed effectively with the aid of modern information technology tools. However, e-learning is not a popular mode of teaching in higher education systems in Sri Lanka except in the application tools like learning management systems (LMS). However, in parallel to the Covid-19 pandemic, the entire education system of the country was partially paralyzed, and consequently, e-learning tools came into practice to make adoption of remote learning (Lockee, 2021). Among those tools, the majority of the higher education systems use LMS, web conferencing, collaboration tools, course authoring software and virtual reality (Hayashi et al. 2020). As this is a new experience for all, both teachers and students face an array of issues and difficulties that interrupt the e-learning process (Chakraborty et al. 2020). As it is difficult to depend solely on conventional teaching and learning under strict health guidelines of Covid-19, e-learning practices became compulsory in the education sector.

Faculty of Fisheries and Marine Sciences and Technology (FMST) is one of the faculties of University of Ruhuna, offering two undergraduate degree programs namely BSc Honours in Fisheries and Marine Sciences degree and BSc Honours in Marine and Freshwater Sciences degree. Although both degree programs were initially interrupted by the Covid-19 pandemic, the faculty was able to restart its academic program and to complete one semester of both degree programs by adopting e-learning facilities. Similar to other universities, the Faculty of FMST was not fully prepared for this sudden transition, but gradually adapted to the e-learning process. During this transition period, there were many concerns on technology, timetable, administration, and communication etc. Thus, the present study was designed to investigate the obstacles and issues faced by students and teachers during this transition period, and to evaluate the impact of e-learning on student performances in order to improve the quality of the e-learning process of the Faculty of FMST.

Methodology

Research Design

A survey was conducted using two different close ended structured questionnaires, which were circulated among students and academic staff using Google forms. In addition, results of students in the most recent two semesters were analysed to determine the influence of e-learning on pass mark of subjects

For the survey, close ended structured questionnaires were prepared by considering the following facts, with few sub- questions

- The most preferred time of the day for online lectures
- Preferred maximum length of a lecture
- Preferred time gap in between two lectures
- Need of visual interaction with the lecturer
- Preferred teaching aids for e-learning
- Preference of mode of teaching and learning
- Difficulties faced during e-learning
- Methods for online assessments

Study Population and Data Collection

Prepared questionnaire was circulated using a Google form among all students of the faculty via the learning management system (LMS), where the students can access through their own LMS account. The entire current student population of the faculty of FMST was selected for the study (n = 297). A separate questionnaire was circulated among all academic staff members of the faculty (n = 28) in order to collect the same information and their experience of e-learning. The data collection was conducted in July 2021 just after one year of commencement of e-learning in the faculty.

In order to check whether the mode of teaching influenced the student's grades of different course units, the exam results of two immediate semesters were compared. The most recent semester used e-learning while the other semester has been entirely covered by conventional teaching. Relationship between the mode of teaching (conventional vs. online) and the chance of obtaining a grade of either

“C” or better was compared for the Level-I, II and III. For this comparison, the average percentage of total pass grades (C or better) and total percentage average of fail grades (C⁻, D, D⁺ and E) for each level of study was estimated, and it was statistically compared by employing χ -square test at the 0.05 significant level. Statistical analysis was performed in IBM SPSS (25 version) while graphical illustrations were done in MS Excel.

Results

Responses of Students

Out of the 297 student population of the faculty, there were 263 responses, which comprised level-I, level-II, level-III and level-IV (89%, 81%, 89% and 95% respectively). According to their responses, the majority (64 %) of them are willing to participate in online lectures in the morning hours from 8.00 – 12.00 noon. This choice was basically due to fewer disturbances at their residence in the morning hours, the freshness of the day and the bad weather conditions in the afternoon.

When considering student preference on the duration of an online lecture, 30 % of students prefer both one hour and two hours lectures followed by one hour and thirty minutes, and more than two hours respectively. Students need a break of at least 10 min in between two online lectures due to several reasons. Among those, dry eyes and headache were prominent among students due to continuing exposure to digital screens and our findings totally agree with Singh et al. (2021). Majority of the students in the Sri Lankan higher education system use either laptops or smart phones for their online lectures (Hayashi et al., 2020) where the similar pattern was observed in the present study. According to the responses of students, continuing online lectures results in heating up of their devices, and consequently technical defects. Similar to the present study, Vershitskaya et al. (2020) emphasized the poor service strategies and insufficient technical support as some of the key issues in e-learning.

There were significant differences ($\chi^2 = 96.67$, $df = 16$, $p < 0.05$) in responses for their preference on mode of assessments. According to student's choices, the most preferred mode of assessment was multiple choice questions (MCQs) (28.4 %), while they also preferred short answer questions (25.4%). However, group presentations fell into either disagree (31 %) or strongly disagree categories (28.6%). These responses revealed that the most preferred mode of assessment of the student is MCQs. As the online assessments are conducted without physical presence of students and instructors at the same place, suitability of online assessments are decided by the existing e-learning infrastructure and overall cost of the process (Muzaffar et al., 2021).

Even though the interaction between student and teacher is important to continue the e-learning process, the majority of the students (59 %) are not willing to have visual interactions with the lecturer.

Major reasons behind aforementioned selection were the interruption of the internet service, and high data usage during video conferencing. However, a considerable proportion (41%) of the students highlighted the importance of visual interaction with the lecturer to maintain a live classroom experience in e-learning.

In response to teaching aids used in e-learning, the majority (84 %) of students preferred PowerPoint presentations followed by LMS based assignments, formal discussions, and activity-based discussions respectively. Overall, students were more willing to accept both online and conventional lectures (60.5 %) than a single mode of teaching either online or conventional.

Responses of Academic Staff

Similar to the student's choice, the majority of the academic staff members (59 %) prefer to conduct online lectures in the morning hours from 8.00-12.00 noon for a maximum duration of either one and half hours or two hours. Fewer disturbances and the freshness of the day are the major reasons for their choice.

Power failures together with difficulties faced during logging in to zoom accounts have been identified as the major issues when conducting online lectures at their residences as well as at the university. In addition, academic staff members have highlighted less interaction with students as a serious concern of online teaching. In distance education, the extent to which teachers and students can interact and communicate well with each other decides the productivity of e-learning (Arbaugh, 2000). According to the experiences of academic staff, 18% of staff agreed that students were not active in discussions, while 53% said their responses were below 25%. Academic staff has indicated that certain practical classes are possible to be conducted in online mode, while some practical classes are totally impossible to be conducted online.

Regarding assessment methods, 35% strongly recommended viva-voce, while 71% agreed for short, answered questions and MCQs. Essay questions with a deadline of submission as an assessment method was strongly opposed by the majority (24%) of academic staff respondents. Compared to conventional teaching, the majority of the academic staff (94 %) rated online teaching as either 1, 2 or 3 on the Likert scale of poor (1) to excellent (5). However, as there is no other alternative to continue the academic activities of the faculty, e-learning was recommended by both students and academic staff.

Relationship Between Grading and Online Teaching

There was no effect of mode of teaching on pass grades of students who followed Fisheries and Marine Sciences Degree ($p > 0.05$), while it affected some Freshwater and Marine Sciences students in a positive manner (Fig. 1). For instance, the percentage of “C” grade or better in level-III was significantly higher ($\chi^2 = 6.29$, $p = 0.009$) following online teaching (97%) than following the conventional method (87%) (Fig. 1 B).

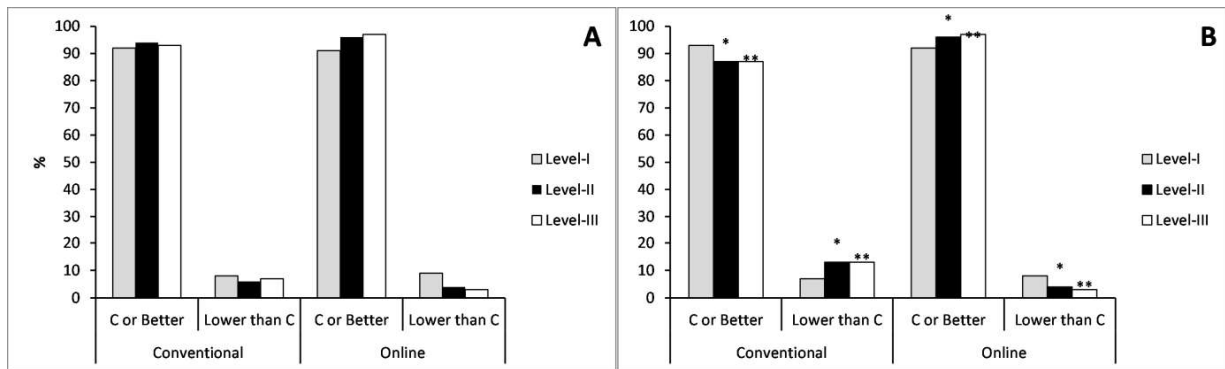


Figure 1: Effect of online teaching on pass grade of students (A: Fisheries and Marine Sciences Degree students, B: Marine and Freshwater Sciences students, different star marks at the same category indicate the significant different at 0.05 level)

Conclusions and Recommendations

Both students and teachers adhere to the online process since there are no other alternatives for teaching in the education system at this transition stage. Continued exposure to digital screens causes health issues in students including headaches and dryness of the eye. Thus, limiting online lectures to a maximum of two hours per session is recommended. The e-learning did not negatively affect the pass mark of the course units of FMST students. Nevertheless, it is recommended to analyse the effects of e-learning on superiors for obtaining higher grades. As a majority of academic staff is not satisfied with e-learning, strategies are needed to be implemented, specifically to develop interaction between student and teacher, and teaching methods.

References

Arbaugh, J. (2000) How classroom environment and student engagement affect learning in Internet-based MBA courses, *Business Communication Quarterly*, 63(4), p9-26.

Chakraborty, P., P. Mittal, M.S. Gupta, S. Yadav and A. Arora (2020) Opinion of students on online education during the COVID-19 pandemic, *Human Behaviour and Emerging Technologies*, 3, p357–365, [online]. Available at: <https://doi.org/10.1002/hbe2.240>.

Hayashi, R., M. Garcia and A. Maddawin (2020) *Online Learning in Sri Lanka's Higher Education Institutions during the COVID-19 Pandemic*, Asian Development Bank.

Lockee, B.B. (2021) Online education in the post-COVID era, *Nature Electronics*, 4(1), p5-6.

Muzaffar, A.W., M. Tahir, M.W. Anwar, Q. Chaudry, S.R. Mir and Y. Rasheed (2021) A Systematic Review of Online Exams Solutions in E-Learning: Techniques, Tools, and Global Adoption, *IEEE Access*, 9, p32689-32712. [online]. Available at: [doi:10.1109/ACCESS.2021.3060192](https://doi.org/10.1109/ACCESS.2021.3060192).

Singh, H.K., A. Joshi, R.N. Malepati, S. Najeeb, P. Balakrishna, N.K. Pannerselvam, Y.K. Singh and P. Ganne (2021) A survey of E-learning methods in nursing and medical education during COVID-19 pandemic in India, *Nurse Education Today*, 99, p.104796. [online]. Available at: <https://doi.org/10.1016/j.nedt.2021.104796>.

Vershitskaya, E.R., A.V. Mikhaylova, S.I. Gilmanshina, E.M. Dorozhkin and V.V. Epaneshnikov (2020) Present-day management of universities in Russia: Prospects and challenges of e-learning, *Education and Information Technologies*, 25(1), p611-621. [online]. Available at: [doi:10.1007/s10639-019-09978-0](https://doi.org/10.1007/s10639-019-09978-0).