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Impact of Online Learning Tools on Academic Performance of University of Ruhuna Students

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Abstract: The sudden paradigm shift into online learning tools, even more encouraged by the COVID-19 pandemic, has transformed higher education. This study examines the impact that the use of online learning tools will have on undergraduate students' academic performance at the University of Ruhuna. A quantitative cross-sectional survey was conducted using a structured online questionnaire among different faculties. The study analyzed patterns of online tool usage, student perception, satisfaction level, and changes in self-rated academic performance before and after the online platform. The findings show that online learning tools help improve access to learning materials, flexibility, and time management in enhancing academic performance. On the other hand, it showed a number of challenges like internet connectivity issues, health concerns, and reduced interaction. The study suggests a hybrid model of learning in order to ma ximize benefits and minimize limitations.

Keywords: Online learning tools, Academic performance, University students, E-learning, Higher education

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I. Introduction

The introduction of ICT has caused a rapid shift in the way that universities around the world approach education through technology. In response to the global interruption of education, universities were forced to adopt Emergency Remote Teaching (ERT), a transition that resulted from the COVID-19 pandemic. For University of Ruhuna, this included the use of software platforms such as Moodle, Google Classroom, Zoom, Microsoft Teams, and WhatsApp, and now forms part of a university's new normal. Research has shown that e-learning tools can positively affect academic performance by allowing students to access educational materials at any time and providing an opportunity for students to work at their own pace. There is also a positive correlation between using online learning tools to study and achieving higher grades: one study demonstrated a 68.3% increase in performance due to the adoption of E-learning. In addition, over two-thirds of all students who participated in online learning (68.9%) stated their academic performance improved when studying through an online platform compared to a traditional classroom model and attributed their better grades to improved time management and studying at their own.

Online learning tools can have an impact that is not universally positive. Students who attend the university of Ruhuna encounter difficulties such as limited internet availability, expensive data packages, inability to access appropriate technology (device), and limited opportunities for interpersonal exchanges with faculty members as they would in a traditional face-to-face environment. There has been some research conducted within the context of Sri Lankan universities, which shows that while getting good internet access is a predictor of having a higher Cumulative Grade Point Average (CGPA), prolonged use of technology (screen time),

psychological distress, and isolation tend to result in lesser academic achievement. Interestingly, within a sample of studies conducted by the Faculty of Technology at the University of Ruhuna, theoretical online class sessions were more productive than practical sessions, and this indicates the constraints of digital tools used in hands-on disciplines.

Although the majority of the students at the University of Ruhuna utilize online learning tools, there is limited empirical evidence available on the actual effect these tools have on students' academic achievement. It is important for university administrators to identify the benefits and limitations of online learning tools so they can make appropriate decisions regarding technology investments and the types of support services offered. This study provides this type of analysis and establishes the relationship between online learning tool usage and student academic performance, as well as identifies the conditions that allow for optimal use and effectiveness of these tools.

II. Literature Review

It is difficult for educational institutions with tight budgets and resources to buy pricey technologies. Therefore, in order to enhance student learning experiences and reduce educational costs, educators must evaluate and utilize free digital solutions wherever feasible [1]. The findings suggest that the implementation of electronic learning technologies might account for 68.3% of changes in Kenyatta University students' academic performance. This suggests that students' academic performance was improved by the use of electronic learning technologies [2]. The analysis of a sample of 340 students is presented, which demonstrates a positive average correlation (r =.431**) between the study variables: academic achievement and the use of digital technologies. This suggests that using these technologies more frequently is linked to improved academic achievement [3]. The average GPA for 2020 is greater than the average GPA for 2019, according to the current study's findings. Because the GPA in 2020 is 3.35, which is higher than the GPA in 2019, the researchers draw the conclusion that e-learning has a higher academic success rate than traditional learning [4].

Most students (68.9%) said that taking classes online helped them get better marks. This demonstrates unequivocally that pupils benefited from online learning. The majority of students saw it as a way to study at their own speed and manage their time as it suited them. This enhanced their comprehension and improved their academic achievement [5]. The findings demonstrate that e-learning and academic achievement are positively correlated. Additionally, the data show no discernible variations in academic performance under e-learning across gender, age groups, and academic programs[6].

The analysis shows that awareness of eLearning platforms accounts for 28.1% of the variance in academic satisfaction (R square = 0.281). Given that the sig. value is.000 and this value is smaller than.01, the positive impact is really large. The alternative hypothesis, "There is a positive and significant impact of awareness of e-learning platforms on the academic satisfaction of undergraduates," can thus be accepted [7]. According to the model, there is a statistically significant positive correlation ($t = 3.996$, $p = 0.00011$) between students' perceived overall gains from AI technologies and their changes in academic performance. The changes in the academic performance score are expected to rise by 0.4207 units for every unit increase in the composite score for perceived advantages [8]. Students believe that using DR increases the productivity of their research, influences their performance in class assignments, helps them with current literature, influences their performance in seminar writing and presentations, influences their performance in exams, improves their levels of literature search, and influences their performance in in-class tests [9].

The findings demonstrated that while a strong internet connection had a favorable link with students' CGPAs, extended usage of digital devices and psychological elements including stress, distraction [10], and loneliness had a detrimental effect. Remarkably, this study shows that CGPA and online theoretical subjects do not significantly correlate [11]. However, the CGPA is negatively impacted by taking practical courses online [12]. Lack of student engagement has been linked to a decline in academic performance in both online and in-person courses; learning methodologies and the caliber of faculty-student interactions are two factors that have a strong positive correlation [13]. University students' academic performance is negatively impacted by the limited availability of

digital gadgets. Their ability to participate in virtual discussions, attend online classes, and turn in assignments on time was significantly impacted by this issue [14].

The utilization of Zoom and Moodle had a positive effect on students' academic performance in practical-related courses because of the online learning platforms' extreme adaptability during the pandemic [15]. Students note that a major issue here is the absence of information, comprehension, and experience acquired through group activities. As a result, the pupils feel that this approach is ineffective for carrying out educational activities [16][17]. More than 70% of students agreed with online learning during the lockdown, according to results on their success [18]. The results of the study indicate that during the pandemic, students' participation, technology, expectations, convenience of use, internet access, and stress all significantly affect their performance [19]. The findings show that using digital tools greatly improves academic achievement, motivation, and student engagement. However, obstacles including inadequate training, restricted access to resources, and technical issues prevent efficient use [20].

III. Methodology

Research Design

This study used a quantitative method of research to find the impact of online learning tools on the academic performance of the undergraduate students of the University of Ruhuna. This quantitative method of research utilizes the cross-section method of the survey to understand the impact of the online learning tools on the academic performance of the students of the university. This method of quantitative research has been selected because it enables the measurement of the patterns of usage of the online learning tool on the academic performance of the students of the university.

Population and Sampling

The population of the research targeted by this specific research includes undergraduate students who are currently studying in the University of Ruhuna and represent all the main faculties, including Science, Engineering, Medicine, Humanities and Social Sciences, Management and Finance, Technology, and the Faculty of Agriculture. Considering the time and resource constraints, the sampling technique used in relation to the current research includes a convenience sampling technique, where the link of the survey questionnaires was provided through various online networks, including student Whats App groups, Facebook pages, and personal messages, and the researchers have been able to attain the target of obtaining 150 responses from the general student population, representing the undergraduate student population of the University of Ruhuna.

Research Instrument

Data were collected through a structured online questionnaire, designed using Google Forms, used as the main instrument for data collection. The questionnaire consists of 20 items arranged into five parts. The first part covers informed consent, which takes care of voluntary responses. Demographic data were derived in the second part with questions Q1–Q4, which asked about faculty, year of study, gender, and age of the respondent. In the third part, questions Q5 through Q8 examined online learning tools usage to capture type, frequency of use, devices used, and access to the internet. The fourth part is about academic performance through questions Q9 to Q14, which established the range of the current GPA, perceived academic performance before and after using online learning tools based on a 5-point Likert scale, perceived benefits, and perceived challenges. User experience was elicited from questions Q15 to Q20 based on satisfaction levels, ease of use, preferred learning platform compared to conventional methods, and suggested improvement.

The questionnaire incorporated multiple measurement scales, including nominal scales for categorical variables, ordinal scales for ranked responses, 5-point Likert scales to measure performance and satisfaction levels (1 = lowest, 5 = highest), and open-ended questions to obtain in-depth qualitative insights into students' experiences.

Data Collection Procedure and Ethical Considerations

The questionnaire was put online and was filled out using Google Forms for two weeks. The link to the

questionnaire was forwarded to different students through different channels in such a way that it covered various faculties and academic years. Each participant was informed of the purpose of the study, and the estimated time of participation was 5–7 minutes. The participants were also guaranteed anonymity and confidentiality of the information provided. Throughout the research process, ethical principles were followed scrupulously. Participation in the research was purely on a volunteered basis. Informed consent was obtained before accessing the questionnaire, no personal information which identified the respondents was requested, and the responses were kept confidential with access only to the researchers. It was also announced that candidates could withdraw at any stage of the research without feeling any sort of distress.

IV. Data Analysis

Once the data collection was over, the data was exported using CSV and Excel formats. We acquired data containing 150 observations and 22 variables, with no missing data points present among the mandatory variables. The data cleaning methods require data to be checked and verified, including the internal consistency and format, especially for text data.

For the quantitative analysis, mainly the techniques of descriptive statistics were employed as a tool for the analysis of the data in the study. For the categorical variables of the study, which included the various faculties, gender, utilization of platform, and frequency of utilization, frequency distributions and percent calculations were employed in the analysis, in addition to the utilization of the mean, median, standard deviation, and range for the analysis of the continuous and ordinal variables that included age, performance ratings, and satisfaction levels, respectively.

Variations in academic performance before and after the utilization of online learning tools can be analyzed with the help of the following formula:

- Mean Difference = Mean (After) − Mean (Before)
- Percentage Improvement = [(Mean After − Mean Before) / Mean Before] × 100

Additionally, individual academic performance outcomes were categorized as improved, unchanged, or declined. For qualitative analysis, responses from open-ended questions were analyzed using thematic content analysis, whereby responses were carefully reviewed, coded, and grouped into common themes to identify recurring patterns and trends in students' experiences and perceptions.

V. Results and Discussion

The analysis reveals that the population under study was comprised of a wide outlay of undergraduate students within the University of Ruhuna, representing students from varying disciplines under the faculties including Science, Engineering, Humanities and Social Science, etc. Further, the students under the analysis included first-year students up to fourth-year students. Not only that, the analysis is comprised of students from varying genders, though not in equal proportions. Further, the majority of the population under analysis belonged to the category between the ages of 20 and 24 years, thereby complying with the typical student population studying in the undergraduate courses in universities across the world.

In terms of application of online learning tools, results showed that Google Classroom was used more than other learning tools, and Zoom, teams, and moodle were used in sequence. Indeed, it shows learners do not only rely on one platform, rather than using learning management tools and video communication altogether. Moreover, Moodle and course material, as well as submitting assignments, were emphasized, establishing its importance as an academic hub.

Furthermore, results have shown that laptops were used mainly, and that there was a use of other devices like smartphones, which were used as complements. Some of the results have also shown that learning activities were adapted in terms of use of learning devices, like laptops being used mainly in attending live lectures and in using assignments. Learning activities have also shown that most of the participants have access to internet connections and that there were fewer participants whose internet connections were intermittent. A key output of this study is that perceived academic performance has indeed improved as a consequence of adopting online learning tools. This average self-reported

performance rating increased from approximately 3.2 out of 5 before the use of online tools to approximately 3.8 out of 5 for regular users of online tools, amounting to an estimated 18–20% improvement. That would imply that the academic benefit of using online learning tools is positive. Additionally, during the plotting of the GPA distribution of the respondents, the majority of students fell within the good to very good performance categories, their GPAs ranging from approximately 3.0 to 3.7, thus further supporting the link between successful use of online learning tools and satisfactory academic performance. Although these results are based on unverified self-assessed measures, they provide a quite interesting insight into the academic the perceived benefits derived by the students.

These beliefs greatly support these findings, as all the respondents were of the opinion that using online tools had enhanced their academic performance. The advantages associated with using online tools included flexibility, communication, organization, as well as an ability to learn at their own pace. The opinions of these target respondents, therefore, helped in finding out that there is an improvement in their ratings as far as academic performance is concerned. From all these, we are able to find out some of the challenges associated with online learning, as observed by the target population. This includes eye strain as a result of too much exposure to electronic devices, factors associated with eye fatigue, less concentration while online, disruptions, as well as feelings of being isolated. We, therefore, find out that even though there is an increase in benefits, constraints are introduced by this kind of technology. In terms of user experience and satisfaction, overall satisfaction with online learning tool use was moderately positive, with students rating it at an average of 3.6 out of 5. Similarly, the average rating regarding perceived usability of the platforms was about 3.5 out of 5, which means while students generally found the tools usable, further improvement is possible in interface design and system usability. These findings emphasize how online learning systems require continuous enhancement and technical support to ensure maximum effectiveness.

Overall, the results suggest that online learning tools have a positive influence on academic performance at the University of Ruhuna, particularly in terms of flexibility, accessibility, and academic support. However, the presence of technological, health-related, and social interaction challenges indicates that exclusive reliance on online learning may not be optimal. The findings support the adoption of a blended learning approach, which integrates online tools with traditional face-to-face instruction to leverage the strengths of both modes while minimizing their limitations. By systematically incorporating student feedback and addressing identified challenges, the University of Ruhuna has the potential to strengthen its digital learning strategies and enhance the quality of education in an increasingly technology-driven academic environment.

VI. Conclusion

This study examined the impact of online learning tools on the academic performance of undergraduate students at the University of Ruhuna based on responses from 150 participants representing multiple faculties and academic year levels. The findings demonstrate a generally positive influence of online learning tools on students' academic performance. The mean self-rated academic performance increased from approximately 3.2 out of 5 before the adoption of online learning tools to around 3.8 out of 5 after their regular use, reflecting an estimated 18–20% improvement. A clear majority of the respondents reported improved academic performance, suggesting that online learning tools have contributed meaningfully to enhancing students' learning outcomes.

The analysis further revealed several key benefits associated with the use of online learning tools. Students most frequently highlighted the flexibility of accessing learning materials at convenient times, the opportunity to revisit recorded lectures to strengthen understanding, improved organization and monitoring of coursework and deadlines, and enhanced communication with lecturers and peers. These advantages indicate that online learning tools help overcome certain limitations of traditional face-to-face learning, particularly constraints related to time and physical presence, while supporting independent and self-paced learning practices among students.

Despite these positive outcomes, the study also identified notable challenges linked to online learning. Technical issues, particularly unstable

internet connectivity, were reported by a portion of respondents and were perceived as barriers to effective participation in online activities. Health-related concerns such as eye strain and screen fatigue resulting from prolonged screen exposure were also commonly mentioned. Additionally, some students reported difficulties in maintaining concentration during online sessions and expressed concerns about reduced interaction and engagement when compared to physical classroom environments. These findings suggest that although online learning tools enhance accessibility and flexibility, they may also introduce challenges related to health, engagement, and social interaction that require appropriate institutional support and intervention.

The overall satisfaction with online learning tools was found to be moderately positive, with an average satisfaction score of approximately 3.6 out of 5, while the perceived user-friendliness of the platforms averaged around 3.5 out of 5. These results indicate that while students generally accept and value online learning tools, there remains considerable scope for improving platform usability, instructional design, and technical support. Regarding learning preferences, students did not demonstrate rigid preferences for either online or traditional learning modes. Instead, many respondents favored a blended or hybrid learning approach, recognizing that different learning activities may be better suited to different delivery methods. This practical perspective suggests that the future of effective teaching and learning at the University of Ruhuna lies in the strategic integration of online and face-to-face instruction.

Limitations and Cautions

Although the study benefits from a relatively larger sample size of 150 participants, several limitations should be considered when interpreting the findings. The use of convenience sampling may have introduced selection bias, potentially overrepresenting students who are more comfortable with or favorable toward online learning. Additionally, academic performance measures relied partly on self-reported data, which may be influenced by recall bias or social desirability effects. The cross-sectional research design also limits the ability to draw causal conclusions regarding the direct impact of online learning tools on academic performance, as other external factors may have contributed to the observed outcomes.

Future Research Recommendations

Future studies should build on these findings by employing probability-based sampling techniques to enhance representativeness and reduce selection bias. Longitudinal research designs tracking students over multiple semesters would enable stronger causal inferences regarding the relationship between online learning tool usage and academic performance. Experimental or quasi-experimental studies examining the effects of targeted training in online learning platforms could further clarify the role of digital literacy in academic success. Additionally, qualitative methods such as in-depth interviews and focus group discussions would provide richer insights into students' lived experiences. Including faculty perspectives, conducting discipline-specific analyses, and examining long-term outcomes beyond grades such as skill development, learner autonomy, and lifelong learning readiness would contribute to a more comprehensive understanding of the value of online learning technologies in higher education.

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