

Discord as an eLearning Tool in Mathematics and Sciences Courses

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Abstract— One of the effects of COVID19 pandemic is the change in modality in education. One of these modalities is the utilization of various social media platforms to aid teaching and learning process. An example of this is the utilization of Discord as a platform to facilitate student learning. This study determined the students' evaluation on Discord as an eLearning Tool in Mathematics and Natural Sciences among different programs in Marikina Polytechnic College. Source of data are the students immersed in Discord as their eLearning platform chosen using purposive sampling. A survey questionnaire was given to them after the semester to determine the functionality, accessibility, technical, mobile design, Data Privacy, Social Presence, Teaching Presence and Cognitive Presence. It was revealed that Discord can be utilized as an eLearning Tool in teaching Mathematics and Natural Sciences Subjects. However, like other eLearning tools, it has its own strengths and weakness that could be aided by other platforms. It is suggested to utilize and determine the possibility of utilizing Discord on other subjects as well.

Keywords— Discord, eLearning Tool.

I. INTRODUCTION

The world experiencing and still in the COVID pandemic era wherein there is a viral infection that can easily make the people sick through cough, touches etc. that is why the educational activity forced to shift to blended or online learning. The educational institutions in the Philippines are currently based on the traditional method of learning wherein teachers and students are in the classroom. Though some schools are blended, a lot of it were face-to-face learning which is common to all. As the COVID 19 outbreak experience worldwide, online learning becomes the solution to continue the education. Online learning has been challenging to the educators on executing their lessons and discussion because the educator has less interaction to students especially to those in early stages of learning (Anderson, 2008). Dhawan (2020) discusses the online learning should be adopted with pros and cons to be weighed. Schools should develop systems (internet access, digital literacy levels, security features etc.) and make sure that learning will be for all.

E-learning refers to the use of internet to deliver instructions. Sangra (2012) concluded that “e-learning is part of the new dynamic that characterizes educational systems at the start of the 21st century, resulting from the merge of different disciplines, such as computer science, communication technology, and pedagogy”. Of these is the discord application. Discord is a versatile communication platform that has gained popularity among students and teachers as an e-learning tool. Originally designed for gamers,

Discord has found its way into the classroom as a tool for online learning and collaboration. The creator of a private server, which is effectively a tiny group or community, moderates it and establishes the rules. Discord can have many channels to organize subjects inside each server: In online meetings, voice and text communication are most prevalent. (Lacher and Biehl, 2018).

Making use of the Discord platform improves management of communication during the teaching and engagement process between students and instructors. This is what has been seen in the Discord application's learning circumstances, which has the capacity to foster social discourse between two distinct classes that are participatory, enjoyable, and laid back. Teachers and learners see immediate advantages from sharing information; thus, Discord might be a different approach (Wulanjani,A. 2018). This study will determine the students' evaluation on eLearning tool such as discord on their mathematics or sciences courses. This study believed that Discord is a viable platform outfitted for online education and cost-effective application that could resolve the financial struggles of the institution. Also, it helps the students, teachers as well as school administrators to positively adopt the online learning and guide in creating policies for conducting online classes.

II. METHODOLOGY

The study utilized descriptive-quantitative method of research to evaluate the students' experience in using the discord application on their e-learning. This study is to determine the students' evaluation on Discord as an eLearning Tool in teaching Higher Education Subjects. This rubric used was adopted in “A Rubric for Evaluating E-Learning Tools in Higher Education” (Anstey & Watson, 2018) to see the levels of achievement and the sustainability of an e-learning tool for the learners. The rubric serves as a guide for instructors in their assessment and selection of e-learning tools through a holistic evaluation of functional, technical, and pedagogical elements. Functionality, accessibility, technology, mobile design, privacy, rights and data protection, social presence, teaching presence, and cognitive presence are the categories included in the rubric. The rubric has been developed with practicality in mind; it aims to aid in the independent evaluation of e-learning tools by decision-makers. Each rubric category adopted the four-point Likert scale where 3 is the highest with verbal interpretation of works well, 2 as minor concern, 1 as serious concern and 0 as not applicable.

The study was conducted during the academic year 2021-2022 in Mathematics and Sciences courses of the first-year students' academic year 2021-2022 in Marikina Polytechnic College. The respondents were enrolled in Mathematics and Science General education subjects, others were in Engineering subjects. Before the administering of survey-questionnaire, the study were fully explained to the respondents. The purpose of the study, the right to refuse participation and the understanding of the confidentiality limitations of the study was discussed.

The survey was administered using the google form at the end of the two semesters and treated using Independent Sample Krus-Wallis Test. In a single, non-normally distributed continuous variable, the Kruskal-Wallis test evaluates differences between three or more independently sampled groups (McKight, 2010). This was used to determine the significant difference between each category of rubric as regards to the course and program taken by the respondents.

III. RESULTS AND DISCUSSION

A. Discord as an online class application for educational use

Most of the teachers are using zoom, google meet, Microsoft teams and discord application in conducting their online classes. All of these are designed with the business world in mind, but can be used for educational purposes. It was found out that using discord in higher education (a systematic review) has the following benefits: ease of access and user-friendliness, useful communication and interaction, and increase social presence leading to engagement (Craig & Kay, 2022). Table I shows the more detailed comparison of different online platforms that educators are using during the time of pandemic.

TABLE I. Comparison of different online platforms for educational use

Category	Zoom	Google Meet	Microsoft Teams	Discord
Maximum number of participants	500	100-250	250	50
Recordings	Allows to record meetings	Allows to record meetings	Allows to record meetings	Allows to record meetings
Share screen	Allows share screen with host enabled	Only one person may share their screen at a time during a videoconferencing		Allows participants to share
Time Limit	40 minutes	60 minutes	No time limit	No time limit
Pricing	-\$14.99 per user per month -Free Version	\$7.99 per user per month -Free Trial	\$5.00 (premium) -Free Version	\$9.99 (premium) -Free Version -Free Trial
Unique feature	Participants can be placed in breakout rooms to hold small-group discussion	In all access to google apps	Tabs to make finding information easy	-Free Version -Free Trial

B. Students' Evaluation in using discord

It can be seen in the table the description and mean in each category on evaluating the e-learning tool for higher education. The functionality, accessibility, technical and mobile design has 4 indicator statements. Then 3 indicator

statements each for privacy data protection and rights, social, teaching and cognitive presence. Overall, the functionality of the discord application was highlighted why teachers and students really like this app. The features and purposes considering the tabs and tools were quite suitable for teaching and learning.

TABLE II. Mean in each category on the discord app

Rubric Category	Weighted Mean
Functionality - Functionality considers a tool's operations or affordances and the quality or suitability of these functions to the intended purpose—that is, does the tool serve its intended purpose well? In the case of e-learning tools, the intended purpose is classroom use.	2.568
Accessibility - Here, we define accessibility both broadly—as outlined by the Universal Design for Learning (UDL) principles of flexible, adaptable curriculum design to support multiple learning approaches and engagement for all students—and in terms of legislative requirements for meeting the specific accessibility needs of learners with disabilities.	2.503
Technical - In a review of e-learning readiness models, researchers found that a user's technology—that is, internet access, hardware, software, and computer availability—was integral to successful e-learning implementation. This category thus considers the basic technologies needed to make a tool work.	2.469
Mobile Design - With the continued adoption of mobile devices worldwide, instructional methods and tools that deliver content using mobile technology will continue to grow and therefore warrant their own assessment category.	2.366
Privacy, Data Protection, and Rights - While e-learning tools offer numerous potential benefits for learners and instructors, they also can entail risks. The primary concerns relate to personal information and intellectual property (IP).	2.542
Social Presence - This category focuses on establishing a safe, trusting environment that fosters collaboration, teamwork, and an overall sense of community.	2.544
Teaching Presence - Garrison defines teaching presence as "the crucial integrating force that structures and leads the educational process in a constructive, collaborative and sustained manner." In this rubric, we interpret teaching presence as related to tool elements that enable instructors to establish and maintain their teaching presence through facilitation, customization, and feedback.	2.544
Cognitive Presence - This part helps you to select technologies that modify or redefine tasks rather than simply substituting one task for another without adding functional value.	2.523

Table III shows the significant difference between the category to subject taken. Using independent sample krus-wallis test, no significant difference found out in functionality, accessibility, technical, mobile design, privacy data protection and rights, and social presence. This shows that no matter the subject is taking the students, it is acceptable to them to use the discord application in educational use. While in teaching and cognitive presence, with 5% significance level, it can glean that there is a significant difference as regards to the subject taken. This indicates that teaching presence in online learning may be a crucial factor in determining the success of the learning experience. Mathematics and science subjects require a lot of problem solving which can be challenging in e-learning (Setayesh, 2018). Teachers need to establish a strong teaching presence to help students understand complex mathematical and scientific concepts (Holt, 2022). While in cognitive presence requires time, listening and careful

responding to encourage sustainable learning. Students need to have more attention and effort to further engaged into online learning.

TABLE III. Significant difference between each category to subject taken

Category	Mean	Computed value (α -5%)	Decision	Interpretation
Functionality	2.54	.054	Failed to accept H_0	Not significant
Accessibility	2.54	.081	Failed to accept H_0	Not significant
Technical	2.37	.129	Failed to accept H_0	Not significant
Mobile Design	2.45	.094	Failed to accept H_0	Not significant
Privacy, Data Protection, and Rights	2.40	.208	Failed to accept H_0	Not significant
Social Presence	2.57	.128	Failed to accept H_0	Not significant
Teaching Presence	2.34	.020	Reject the H_0	Significant
Cognitive Presence	2.33	.010	Reject the H_0	Significant

Table IV presents the significant difference between each category in rubric as regards to the program. The institution that this research conducted has five programs offered; Bachelor of Technical Teacher Education, Bachelor of Industrial Technology, Certificate of Technology, Bachelor of Science in Entrepreneurship, and Bachelor of Electronics Communication Engineering. All of these programs require to take general subjects in Mathematics and Sciences. It was found that only cognitive presence has significant difference to the program enrolled by the participants. This implies that enhancement of cognitive level in e-learning should be more crucial and requires facilitation to the learners. It is important to the teachers. Cognitive presence promotes higher order thinking in which critical thinking, reflection and deep learning was the objective.

TABLE IV. Significant difference between each category to the program

Category	Mean	Computed value (α -5%)	Decision	Interpretation
Functionality	2.54	.189	Failed to accept H_0	Not significant
Accessibility	2.54	.112	Failed to accept H_0	Not significant
Technical	2.37	.259	Failed to accept H_0	Not significant
Mobile Design	2.45	.215	Failed to accept H_0	Not significant
Privacy, Data Protection, and Rights	2.40	.058	Failed to accept H_0	Not significant
Social Presence	2.57	.173	Failed to accept H_0	Not significant
Teaching Presence	2.34	.069	Reject the H_0	Not Significant
Cognitive Presence	2.33	.021	Reject the H_0	Significant

IV. CONCLUSION

The study was to evaluate the use of discord application as a digital platform to support efficacy of online teaching and learning at Mathematics and Sciences courses in tertiary education. Discord as an e-learning environment have been identified as beneficial including ease of access, increased engagement and improve learning outcomes. The results depict that discord offers potential advantages as an e-learning compared to other any online platform. It is important to the note that the success of using this application depends on the several factor such as the quality of remote communication environment, the level of student engagement, and the adaptability of the tool to student needs. It is recommended that to seek the feedback of the students in other subjects and year level on the usefulness and satisfaction of using discord as a main platform for teaching and learning interaction.

V. LIMITATIONS

This research is based on free version of discord. All about concerning the class size in which relative to the bandwidth have not been discussed. Additionally, Discord is –in all sense and purpose –an online service, which means it will be susceptible to updates and modifications as time goes on. These are gaps that future research into the matter might explore further.

Overall, Discord can be an effective e-learning tool in mathematics and science subjects, but its success depends on several factors that need to be taken into consideration.

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