Design of the Discord application as an E-learning tool at the University of Sciences and Humanities

Ysla Espinoza Dayana[1], Ocas Medina Andre[1], Laberiano Andrade-Arenas[1]
[1]University of Science and Humanities, Peru, dayyslae@uch.pe, andocasm@uch.pe, landrade@uch.edu.pe

Abstract—**Due to the covid-19, this 2020 the education gave a drastic change, we passed from the presence modality to the virtual one at the beginning of this year, arriving to use diverse tools of E-learning like Zoom, Meet, among others. Therefore our goal is the alternative use of another communication tool of the gaming community that is Discord. Using the Design Thinking methodology, we conclude that Discord meets all the requirements to be an E-learning tool. When it came to prototyping and running the virtual classroom in the application, they gave very good results within our university through a virtual classroom simulation. At the end of the simulation, a satisfaction survey was given to the participants that provided us with the data to conclude that the Discordia platform has enough services to conduct an online class.**

Keywords—**Discord; E-learning; Communication tool ; Meet ; Zoom ; Design Thinking.**

Design of the Discord application as an E-learning tool at the University of Sciences and Humanities

Ysla Espinoza Dayana[1], Ocas Medina Andre[1], Laberiano Andrade-Arenas[1]
[1]University of Science and Humanities, Peru, dayyslae@uch.pe, andocasm@uch.pe, landrade@uch.edu.pe

Abstract—**Due to the covid-19, this 2020 the education gave a drastic change, we passed from the presence modality to the virtual one at the beginning of this year, arriving to use diverse tools of E-learning like Zoom, Meet, among others. Therefore our goal is the alternative use of another communication tool of the gaming community that is Discord. Using the Design Thinking methodology, we conclude that Discord meets all the requirements to be an E-learning tool. When it came to prototyping and running the virtual classroom in the application, they gave very good results within our university through a virtual classroom simulation. At the end of the simulation, a satisfaction survey was given to the participants that provided us with the data to conclude that the Discordia platform has enough services to conduct an online class.**
Keywords—**Discord; E-learning; Communication tool ; Meet ; Zoom ; Design Thinking.**

I. Introduction

E-learning has become an increasingly important way of learning and teaching in recent decades and has been recognized as an effective learning method. The growing number of Internet users with smartphones and tablets worldwide has supported the spread of e-learning, not only in higher education and vocational training, but also in primary and secondary schools. E-learning and traditional distance education approaches share the emphasis on "anytime, anywhere" learning and the assumption that students are at a distance from the instructor[1].

We will provide an overview of the current state of education through internet tools in times of pandemic.We will start before going deeper into the subject and our proposal with a concept of this teaching modality and its origins[2]. E-Learning is all those strategies, methodologies or systems that help distance learning through computers or other electronic devices that are connected to the Internet and allow the person to learn virtually.Through the distribution, organization and transmission of information among different types of educational or organizational communities.

The contribution that E-Learning has had throughout this time of pandemic that we are living, has been favorable due to the reduction of costs of the pensions of the educational institutions at world-wide level.Due to social distancing, students will no longer be able to gather in specific locations for educational activities. All this will be replaced by online learning through more friendly interfaces[3]. This modality became known recently because of the current pandemic in which the world finds itself. And it is not confirmed that it is the best way to learn.But we are getting used to this new online learning format.

Due to the situation we are living as students we have tried to adapt to this new learning modality and we have a proposal to improve the communication between students and teachers of the University of Sciences and Humanities. After having had the experience in the last cycle with this new modality, we were varying between the Zoom and Meet application.And our experience was not entirely favorable. Thanks to this experience, we were able to find a platform that would suit our communication needs and with a friendly interface.

Something that is linked to the theme of e-learning would be real-time communication (RTC)[4] . It is an essential part of modern convergence networks. Interactive voice communication, conferencing, video, chat, broadcast and presence. They are very used and popular today. These services work extensively with IP networking services and applications. Some of these web services already use RTC, but need downloads, native applications or external plug-ins. Some of these include Skype, Facebook (which works with Skype) and Google Hangouts (which uses the Google Talk plug-in)[5]. Downloading, installing and updating add-ons can be complex and at some point annoying.

The proposal we present is the following. Discord is a voice chat application known among the gaming and streaming community, which allows messaging between users and voice over internet protocol (VOIP) [6].

Using the Discord platform optimizes the management of communications in the process of teaching and interaction between students and teachers. This has been observed in the learning conditions when using the Discord application, which is able to create a climate of social debate between two different classes that is interactive, fun and relaxed. Educators and students also feel practical benefits from sharing knowledge, so Discord can be an alternative solution to online conferencing[7].

When using Discord, teachers or instructors have the option to create a server within Discord, which functions as a virtual classroom, then store student accounts within the server, enable group voice and chat rooms, and finally classify

students into groups for classroom activities[8]. Within the chat rooms, the teacher can supervise the vocabulary of the students, how concentrated the teams are and how essential the participation of the students would be.

To this end, our goal is to demonstrate that the Discord platform can be used as an effective and efficient means of online learning and communication.

This paper is structured as follows ,section number II will describe in detail the methodology used for the use of the Discord application.Section III will show the results and discussion obtained and finally in section IV the conclusions.

II. METODOLOGHY

In this part we will detail the steps that we will follow for the development of Discordia's application as a means of learning and online communication, through which we will use the Design Thinking methodology, since it offers us a more practical way to work on our project, besides being a design tool that allows us to formulate ideas to find the solution to our problems, we will also detail the steps and tools that will be used.

A. Methodology Design Thinking

The Design Thinking methodology is oriented to the generation of solutions within a proposed framework. Which is divided into a series of stages, of which are interactive. This methodology serves as a tool for the world of design and creativity to create innovative ideas that are the solution to a real problem of some user. It is of a great help in the initial phase to the creation of some project[9]. To achieve a successful result it is important to follow the order of each of the processes that make up the Design Thinking methodology as shown in Fig1. Below, we briefly explain each of the phases and how to carry them out.
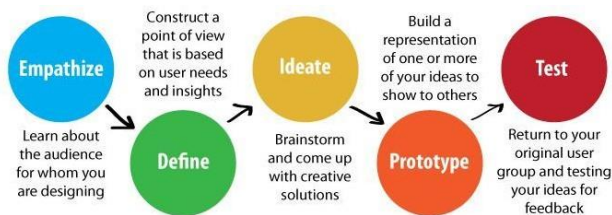

Fig. 1. Design Thinking Process

1) Empathize: As a first instance, we touch upon a stage of active observation aimed at identifying the needs of the people we are addressing and what is really significant for them. Empathy has a fundamental role during this stage, so at all times we must put ourselves in the shoes of the end user[9]. The methodology has as its main objective the satisfaction of needs; therefore, it is necessary to put ourselves in the position of the person to whom we are trying to solve the problem in order to find an answer.

2) Define: With all the information acquired from that initial observation, we must be able to specify and clarify the challenge presented to us, so that it has value for our clients and that we can provide a viable solution to it. Knowing in depth the team of people where we are going to solve the problem. Clearly defining which problem or problems we will try to solve is paramount in this phase[10].

3) Ideate: Once the problem of our clients is defined, during this stage we must think of ideas that will cause them satisfaction. We will strive to generate as many ideas as possible, each one independent from the others and making sure that they do not resemble in any way our initial idea or that they are connected[11].

4) Prototype: We will now move from theory to practice. Therefore, we will give shape to the solution we have thought of, we will create a product that will allow us to check the reaction of our target audience[9]. Once you have the idea to solve the problem, it is time to make the test design. It could be the prototype of a product, a strategy, a service among others. The fundamental thing is that your idea is functional.

5) Evaluate: It is time to interact with the designed prototype. An analysis will be made to verify if this solution is really the most suitable to solve the users' needs.

This is a step that can be executed numerous times, if the first idea does not solve the problems raised, we must start again until the desired result is achieved. Although sometimes it is not necessary to return to the beginning, in other cases it is sufficient to make only a few improvements before the final project is completed.

In the final stage of this iterative process, we will test the user against the service or product developed, we will analyze how the user behaves with it and we will work to draw out a lesson that will allow us to perfect the proposal.

III. CASE STUDY

Due to the pandemic that we are living in this 2020, we changed the face to face classes by virtual and we had to live this new experience for us . So that the virtual classes work, it was necessary to resort to software tools such as zoom, Meet. The students of the university of sciences and humanities along the classes, identified difficulties to communicate. This affects the level of communication and learning between students and teachers. It was also detected that students interacted less in virtual classes than in face-to-face ones. But to do this, we had to visualize what the students' needs were in order to find the tool that would meet the needs of a virtual classroom.

A. Shadowing to empathise

We began with the first process of Design Thinking, which is to be empathetic, so we use Shadowing, which is to put

TABLE I
COMPARISON OF THE DIFFERENT PLATFORMS

Comparison of the different meeting platforms			
Characteristics /types	zoom	Meet	WhatsApp
Maximum number of participants	Up to 500 participants	100-250 participants	Limit up to 4 people
Recording	Allows you to record your meetings	Allows you to record your meetings	No recording allowed
Share screen	Allows screen sharing per person, as long as screen sharing is enabled by the host	Allows any participant to share	No screen sharing
Share sound	Allows you to share the audio on the screen	No audio sharing	No sharing of sound
URL	The unique URL generated in each host is used for the different meetings	Generates a random URL for each meeting created	Does not generate any URL
Access	Allows you to download the application	In the same Google	In the same application
Calls	Allows access through calls	Does not allow access through calls	Allows access by call
Video Calling Bandwidth	600 kbps (download) 1,2 Mbps (upload)	10 Mbps	73,5 MB

yourself as a spectator to observe and document the different points of view of each person, to find the problem[12]. By using Shadowing we realized the different opinions of the peers when interacting with the most common communication and learning tools that would be: Zoom, Meet and Whatsapp. This last application was used to keep in touch with the teacher and send files on certain occasions.These applications mentioned, we can observe them in the table I. Where it is shown the difference between the diverse platforms that we have been using until the present time.

B. Definition of the problem

After empathizing with the students of the University of Science and Humanities, after a collection of the characteristics of each online learning tool that not all tools meet the needs of students, so we will now collect information on the needs required by each student through a form shown in Fig2. Over the course of the year, universities and other educational institutions opted for the zoom and meet platforms for online classes[13]. The first thing we notice as a common problem is that most college students are used to attending face-to-face classes.This not only affected the students, it also affected the teachers, since they had to train and attack these new ways of teaching. But we realized that not all the tools met the needs of the student and teacher.

1) Research instrument: To validate our preceptive, a satisfaction form had to be created to see the difficulties that these platforms have. There were 20 students from the university of sciences and humanities who participated in this research anonymously. After a meeting with the students they were asked to fill in the questionnaire through a link. There were 10 questions in the questionnaire fig2. The questionnaire was anonymous and closed with unique yes or no options.

Fig. 2. Satisfaction Questionnaire

C. Devising the solution

The next thing we will do is devise a solution with a proposal after noticing the deficiencies of the platforms identified with the form in Fig2.

As a member of an online community, we have sometimes had the need to communicate all at once in one call as was done a few years ago with Skype. Currently there are platforms such as Discord that have most of the features needed for people from the same community to interact with each other in a virtual and private space.Where they can chat, make group or individual calls, make live broadcasts, share files, create groups within the same channel, etc. Therefore, we want to implement this platform at our university, since

we notice that the platform has most of the functions that those used so far lack.

D. Prototype of new Discord learning tool

Discord is a voice and text communication platform for the online gaming community. It is a mobile and computer application usually used by a team of players to communicate by voice and text chat.

1) The use of the Discord application : Before conducting the virtual class using Discord, the researcher must first create a channel with the name of his course.The researcher should create voice channels and messages, so that students can respond using voice or by sending messages to the channel's chat.

The researcher conducted virtual meetings. Before starting the virtual class, students were asked to download Discord to their cell phone or laptop. Then, they joined the channel I had created earlier. During the virtual classes, the students had several listening activities to involve their participation in the listening class. They were top-down and bottom-up listening activities. Most of them were dedicated to many tasks that forced them to always give their answer in an active way.Students could also be asked to turn on their microphone and respond one by one. Fig. 3 of the listening channel using Discord as follows:
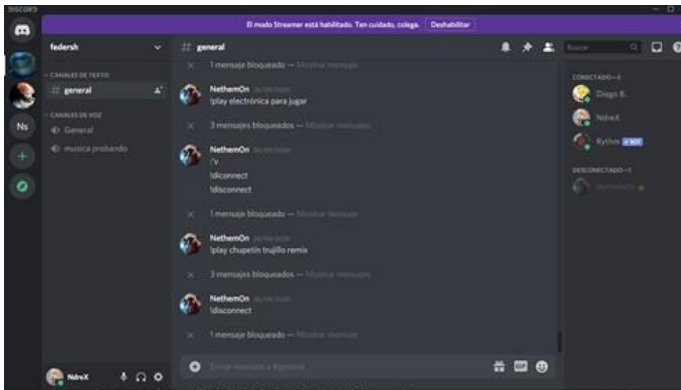

Fig. 3. The listening channel created using Discord

IV. RESULTS AND DISCUSSION

A. About the case study

After conducting a satisfaction questionnaire, about research on an alternative tool that meets the requirements of a virtual classroom. Within the gamer community, there is a platform called Discord that makes communication possible in real time, by messaging and voice. What would be necessary for a better understanding and coordination when communicating. Apart from the communication tools that Discord has, you also have the option to send documents, images, videos and individual or group calls. Therefore, we developed a comparison based on the table1 with the tools we have used in the beginning of the pandemic. The alternative

tool we propose is Discord, as shown in the comparison in table2. Where you can see the comparison of Discord and the other applications we have used until the current cycle. It was concluded that Discord would be a complete platform where it offers the services of Zoom, Meet and Whatsapp. All in one platform that would be Discord, to offer a better experience to the users.

At the time of starting the new project, it is necessary to translate the ideas into some physical or digital document of the necessary requirements that a virtual classroom needs. Therefore we will develop our virtual classroom prototypes in the Balsamiq desktop app. It is a tool that allowed us to make a prototype of the view of each of the platforms we saw in table II [14]. In the first developed prototype shown in Fig. 4, of what a virtual classroom would look like in Zoom Meeting. The platform fulfills the functions of audio, voice, chat, camera, screen sharing, requesting remote control of a computer and recording the sessions performed. It also has the list and search of the users connected in the meeting[15]. The second prototype in Fig. 6 is about the virtual classroom at Meet. The platform fulfills the functions of audio, voice, chat, camera, screen presentation, open a whiteboard Jam, change the background and send invitations. It also has the list of participants in the virtual classroom[16]. Finally, in the last prototype developed in Fig.5, we have the Discord platform as the alternative to the previous ones mentioned. It has the common functions with Meet and Zoom. Apart from other functions such as; a general chat where you can communicate at any time, personalized meetings, keyboard shortcuts, appearance, language, among others [17].

Fig. 4. Virtual classroom prototype in zoom created in Balsamiq

1) Creating a virtual classroom on the Discord platform : After mentioning a prototype of the Discord class, a small simulation was carried out with 20 students from the University of Sciences and Humanities from different careers, half male, half female. To then make them participate in a questionnaire as shown in Fig7, to know their degree of satisfaction when using the Discord as a means of E-learning.

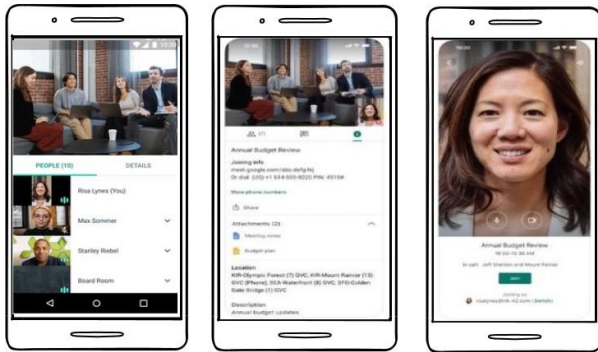Fig. 5. Prototype of virtual classroom in Discord created in Balsamiq

Fig. 6. Prototype of virtual classroom at Meet created in Balsamiq

TABLE II
COMPARISON OF THE DIFFERENT PLATFORMS VS DISCORD

Comparison of the different meeting platforms			
Characteristics /types	zoom	Meet	Discord
Maximum number of participants	Up to 500 participants	100 to 250 participants	50 participants
Recording	Allows you to record your meetings	Allows you to record your meetings	Allows you to record your meetings
Share screen	Allows screen sharing per person, as long as screen sharing is enabled by the host	Allows any participant to share	Allows any participant to share
Share sound	Allows you to share the audio on the screen	No audio sharing	Allows you to share the audio on the screen
URL	The unique URL generated in each host is used for the different meetings	Generates a random URL each meeting created	Does not generate URL. But it allows to send invitations to enter the server.
Access	Allows you to download the application	In the same Google	In the same application
Calling	Allows access through calls	Does not allow access through calls	Allows access by call
Video Calling Bandwidth	600 kbps (download) 1,2 Mbps (upload)	10 Mbps	64 kbps

TABLE III
RESULTS OF DISCORD'S SATISFACTION FORM

Results of the questions		
Number of questions	Yes	No
Question 1	15%	85%
Question 2	15,8%	84,2%
Question 3	25%	75%
Question 4	26,3 %	73,7 %
Question 5	38,9%	61,1 %
Question 6	75%	25 %
Question 7	10%	90 %
Question 8	60%	40%
Question 9	Most responded that it was for friends and family	
Question 10	100%	0%

2) Discord's Satisfaction Survey Answers: Shortly after the virtual classroom simulation, UCH students answered Discord's satisfaction survey. In Table III we can see the result as a percentage of each question asked in the survey. In addition it gives us to understand that the question 1 the 80% of the people did not present difficulty at the moment of installing the program. In the second question 84.2% of people had no problems connecting to the server. In the third question 75% of the people had no problems with the audio of the program. In the fourth question 73.7% had no problems with the screen presentation. In the fifth question 61.1% of the people had no difficulty in creating a server on the platform. In the sixth question 75% of the people found the Discord interface pleasant. In the seventh question 90% of the people found it easy to join a server. In the eighth question 60% of the people were aware of the existence of the platform. In the ninth question most people found out about the platform through a family member or friend. In the tenth and last question 100% of the people recommended to implement it in the university.

B. About the methodology

Design Thinking is the methodology that determines the reasoning processes aimed at innovation and the development of revolutionary ideas. Some of the best known features of Design Thinking are to make visible and tangible the ideas defined to establish their impact and make corrections or improvements. While other methodologies follow a sequential

and somewhat rigid path. Design Thinking allows the ideas proposed during the development stages not only to remain in documents or paper, but to be materialized and tested.

1) Advantages : Although there are several advantages of using Design Thinking, we can summarize some of them[18].
• Safe process for confronting problems. A series of tools and techniques are designed to be used to provide solutions to a problem, both in companies and in other contexts.
• Emphasis on people. It is a customer centric type of methodology and its main potential is that it provides a solution to real problems.

Satisfaction form for Discord platforms

Here we will see your satisfaction with the platform that was used as a test to study online and communicate

1.- Did you have difficulty installing the program?
- ○ Yes
- ○ not

2.- Did you have connection problems with the server?
- ○ Yes
- ○ not

3.- Did you have problems with the audio of the program?
- ○ Yes
- ○ not

4.- Did you have problems with the presentation of the program?
- ○ Yes
- ○ not

5.- Was it difficult to create a Discord server?
- ○ Yes
- ○ not

6.- Did you find the Discord interface nice?
- ○ Yes
- ○ not

7.- It difficult for you to join a Discord server?
- ○ Yes
- ○ not

8.- Were you aware of the existence of the platform?
- ○ Yes
- ○ not

9.- How did you find out about the platform?

10.- Would you recommend implementing it at the university?
- ○ Yes
- ○ not

Fig. 7. Satisfaction Form Discord

• Testing of real solutions. Among its main principles is that each part must be tested with real people to guarantee that the solutions solve real problems.

2) Disadvantages : In the problematic part of the methodology, we can mention the main[19].
• It causes a lot of uncertainty
• Generates a feeling of risk taking
• It generates a continuous change that can destabilize certain collaborators.

3) Comparison : The Design thinking methodology is in charge of ending problems between the different areas of a company, making them work together and providing them with a group of methods and tools to generate a greater synergy between them.
In the opposite case, the Lean Startup methodology, has as objectives: to test with the real market before making decisions, minimizing the loss through validated learning, this is easily adaptable for small companies.
Either methodology can be equally useful. These two methodologies are based on understanding the need on which a

product is based [20].

V. CONCLUSIONS AND FUTURE WORK

In conclusion the Discord platform that is originally for video game players turned out to be a more capable e-learning tool than the current ones. The survey conducted after the virtual classroom simulation provided us with the data to conclude that the Discord platform has sufficient services to conduct an online class. Apart from the virtual social space it generates, where all participants can interact at any time of day. The friendly platform interface provides better comfort and relaxation at the time of the class. And thus be able to generate a better study environment.

For future work it is recommended to expand the article by complementing it with other video conferencing tools and educational platforms.

REFERENCES

[1] B. Gros and F. J. García-Peñalvo, "Future trends in the design strategies and technological affordances of e-learning," 2016.

[2] M. Martini, "E-learning: new strategies and trends," *Revista Tecnología, Ciencia y Educación*, no. 6, 2017.

[3] J. Macleod and E. Kefallonitis, "Trends affecting e-learning experience management," in *Strategic innovative marketing*. Springer, 2017, pp. 753–758.

[4] N. Pandey and D. Bein, "Web application for social networking using rtc," in *2018 IEEE 8th Annual Computing and Communication Workshop and Conference (CCWC)*. IEEE, 2018, pp. 336–340.

[5] G. Carlucci, L. De Cicco, S. Holmer, and S. Mascolo, "Congestion control for web real-time communication," *IEEE/ACM Transactions on Networking*, vol. 25, no. 5, pp. 2629–2642, 2017.

[6] E. Efriani, J. A. Dewantara, A. Afandi *et al.*, "Pemanfaatan aplikasi discord sebagai media pembelajaran online," *JTIP: Jurnal Teknologi Informasi Dan Pendidikan*, vol. 13, no. 1, pp. 61–65, 2020.

[7] A. N. Wulanjani, "Discord application: Turning a voice chat application for gamers into a virtual listening class," vol. 2, pp. 115–119, 2018.

[8] Lacher and Biehl, "Using discord to understand and moderate collaboration and teamwork," in *Using discord to understand and moderate collaboration and teamwork*. ACM Digital Library, 2018, pp. 1107–1108.

[9] S. Kernbach and A. S. Nabergoj, "Visual design thinking: Understanding the role of knowledge visualization in the design thinking process," in *2018 22nd International Conference Information Visualisation (IV)*. IEEE, 2018, pp. 362–367.

[10] R. Dam and T. Siang, "What is design thinking and why is it so popular," *Interaction Design Foundation*, 2018.

[11] M. Stickdorn, M. E. Hormess, A. Lawrence, and J. Schneider, *This is service design doing: applying*

service design thinking in the real world. ” O'Reilly Media, Inc.”, 2018.

[12] G. Grimbsy, “Using discord to foster a learning community,” in *Innovations in Teaching & Learning Conference Proceedings*, vol. 11, 2019, pp. Hall–Hall.

[13] C. E. Flórez, “Más allá de zoom, teams y google meet: en busca de la auténtica educación virtual,” 2020.

[14] P. Bravo Sosa, “Tools: Balsamiq,” 2020.

[15] B. K. Wiederhold, “Connecting through technology during the coronavirus disease 2019 pandemic: Avoiding “zoom fatigue”,” 2020.

[16] R. S. Al-Maroof, S. A. Salloum, A. E. Hassanien, and K. Shaalan, “Fear from covid-19 and technology adoption: the impact of google meet during coronavirus pandemic,” *Interactive Learning Environments*, pp. 1–16, 2020.

[17] M. Anderson, “Discord and the harbormen gaming community,” 2019.

[18] G. Mosely, N. Wright, and C. Wrigley, “Facilitating design thinking: A comparison of design expertise,” *Thinking Skills and Creativity*, vol. 27, pp. 177–189, 2018.

[19] G. N. Nedeltcheva and E. Shoikova, “Coupling design thinking, user experience design and agile: towards cooperation framework,” in *Proceedings of the International Conference on Big Data and Internet of Thing*, 2017, pp. 225–229.

[20] C. Ávalos, A. Pérez-Escoda, and L. Monge, “Lean startup as a learning methodology for developing digital and research competencies,” *Journal of New Approaches in Educational Research (NAER Journal)*, vol. 8, no. 2, pp. 227–242, 2019.