

HUOM! Tämä on alkuperäisen artikkelin rinnakkaistallenne. Rinnakkaistallenne saattaa erota alkuperäisestä sivutuksestaan ja painoasultaan.

PLEASE NOTE! This is an electronic self-archived version of the original article. This reprint may differ from the original in pagination and typographic detail.

Käytä viittauksessa alkuperäistä lähdettä:

Please cite the original version:

R. Khan, N. Sethi (2022) TRANSITION FROM FACE-TO-FACE TO HYBRID HACKATHONS DURING COVID-19 PANDEMIC. ICERI2022 Proceedings, pp. 321-327.

To link to this article: [10.21125/iceri.2022.0123](https://doi.org/10.21125/iceri.2022.0123)

TRANSITION FROM FACE-TO-FACE TO HYBRID HACKATHONS DURING COVID-19 PANDEMIC

R. Khan, N. Sethi

Haaga-Helia University of Applied Sciences (FINLAND)

Abstract

Digital technologies played an increasingly important role during the pandemic due to the transition to distance learning. Hackathons, which have previously been face-to-face were tested as fully online and as hybrid ones during the COVID-19 pandemic. This paper seeks to study two entrepreneurial hackathons: a fully online and a hybrid one, which was a combination of both face-to-face and virtual learning platforms. The international students from higher educational institutions participated in the hackathons. The use of digital platforms made it possible to conduct these hackathons during the pandemic. This paper presents varied digital learning platforms and their effective usage during the hackathons. This paper also reviews the progression of the HACK-IT project, Hackathon and ICT-based Innovative Methodologies in Higher Education, which was established after the hybrid hackathon, and aims to create more flexible, inclusive, and secure technology-enhanced open, digital education. The necessity for online hackathons and other digital methodologies during the pandemic led to the development of the HACK-IT project. This project supports the digital capabilities of educators by developing an online hackathon methodology. This study provides insights into the new forms of teaching and learning as well as innovative digital methodologies.

Keywords: digital technologies, virtual learning platforms, hybrid hackathon, online hackathon, entrepreneurial hackathon, COVID-19 pandemic.

1 INTRODUCTION

Digital technologies in the field of education represented by computers, smartphones, and video-based communication platforms brought unprecedented change to our lives during COVID-19. Educators and students became one of the largest groups of digital technology users during the pandemic [1]. According to Sun, Tang, & Zuo (2020), educators have put greater effort into preparing for online courses, innovating and designing lessons [2]. Research has shown us that the major technologies used in education during the pandemic have been video-based communication platforms such as Zoom, WebEx, Google Hangouts, Blackboard, WhatsApp, Coursera, Google Cardboard, VoiceThread, Cloud Classrooms, and so on [1]. Educational institutions had to prepare for student-centered learning through the mobilization of digital technologies and reinvent themselves by adapting to different teaching and learning strategies [3]. One such student-centred learning strategy, which has been used extensively in higher educational institutions (HEIs) in Finland has been Hackathon based learning. There has been a shift from a traditional classroom setting to more action-oriented learning over recent years. European HEIs use hackathons as they are interested in offering action-oriented learning methods to their students.

Hackathon is defined as an event where people gather to think and generate innovations. All hackathons follow a structure: team selection, creative problem solving, and preparation of the presentation/pitch. They last between 8 to 48 hours in which participants are challenged to generate innovation and the best idea selected by the jury is rewarded with a prize [4]. Since the beginning of 2000s, these events have been organized by organizations that looked outside their boundaries to improve innovation in order to improve their businesses [4]. Nowadays, hackathons are not just limited to organizations but educational institutions have adopted them as an effective learning method [5]. Hackathon is not a new idea – it originated from the field of software engineering [6], [7]. While using them for other research fields, there are a unique set of barriers to overcome. Research has shown that organizing and running a hybrid or an online hackathon will take considerably longer and will have its own set of challenges [6].

The COVID-19 pandemic made virtual events fairly common [6]. As there has been a transition from face-to-face to online teaching, hackathons also witnessed this transition and shifted to online and hybrid modes during COVID-19 pandemic. These unprecedented changes empowered educators with significant knowledge about online hackathon methods and varied digital platforms as well as their effective usage. Besides, the online hackathons can be executed much faster and at lower costs

compared to face-to-face events [8]. The online hackathons organized during the pandemic provided a valuable opportunity to learn the best practices of running such hackathons.

Based on the above theoretical standpoints, there is a need to understand how hackathons evolved during the COVID-19 pandemic and how this transition from face-to-face hackathon to hybrid/online hackathon affected the educators and participants, what are the best practices and how to remove barriers that the participants might encounter. Our study describes the execution of an online and hybrid hackathon dedicated to the challenges of the COVID-19 pandemic and participant experience, which will be useful to other HEIs.

This paper presents varied digital learning platforms and communication channels, and their effective usage during online and hybrid hackathons. It also highlights the lessons learned during the hackathons. This paper uses ethnographic observation to understand the transition from face-to-face to hybrid hackathon. The educators' understanding of varied learning platforms and hackathons in general are evaluated using a questionnaire. The main contribution of this study is that it offers an insight into the effectiveness of hybrid and online hackathons and provides guidance to educators, who would use online hackathon methodology in their teaching.

The remaining sections of the study will discuss the hackathon setting—description of online and hybrid hackathon, and the methods used in the methodology sub-section, followed by results and conclusion.

2 METHODOLOGY

2.1 Hackathon Setting

2.1.1 Hybrid Hackathon

Due to the pandemic, there was a need to explore the options to organize a hybrid hackathon. A hybrid hackathon was organized in September, 2020. This event consisted of over 90 students and 8 mentors. The first day was arranged face-to-face at a physical location in Finland and the following two days were organized online through virtual learning platforms. During the first day, 7 mentors and 31 students participated in the event onsite while 16 students and 1 mentor participated online as the event was streamed live. During the next two days, 37 students participated online.

The three main aspects of hackathon had to be replicated online. Networking to form teams, ideation and developing the idea. To replicate the flow of face-to-face hackathon on an online/hybrid platform can be a challenging experience. In order to host an online event, a lot of preparation had to be carried out. This included technical issues, good connection, and clear flow of events. To achieve and successfully host a hybrid hackathon, the choice of the platform was vital. A series of digital tools were reviewed, and the criteria for the evaluation were based on costs, usability, and innovativeness.

Platform selection: After careful review, Deal Room was selected as a platform to host the hybrid hackathon. As this is an online tool there had to be an approval for the tool from the IT department of the university to check if it complied with the European Union (EU) and General Data Protection Regulation (GDPR) policies. Deal Room platform was chosen as it allowed the participants to connect with each other, set meetings with their mentors and host sessions. It created a one stop venue like a face-to-face hackathon. Since this was a new platform, IT support was requested from Deal Room for the event to run smoothly.

Team formation: The students were asked to submit their ideas prior to the hackathon so that participants could be divided into teams beforehand. Generally, in a face-to-face hackathon, the teams are formed while interacting with other participants. Some participants switched teams once they started to interact with each other online and offline.

Ideation and idea development: The following two days were held online, and the hackathon was carried out on MS Teams. There were set teams channels for different teams, which were coordinated by a moderator, who collaborated with all the team members and the mentors. The mentors were directed to their teams to join the channel. The final pitch was sent to the moderator, so the order of the pitching and the presentation was done with the moderator. This avoided unnecessary delays and ensured the smooth flow of events. The jury had their own room/channel to have the discussion. Overall, despite a few technical challenges the feedback was good from the participants and the jury.

2.1.2 *Online Hackathon*

As a second part of the project a completely online hackathon was organized by using Google design sprints. This hackathon hosted over 100 students from three different partner institutions across three countries –Finland, Estonia and Latvia.

The students were instructed beforehand to share their ideas via a google form so the teams could be matched as per their interests and preferences. The host and the google design lead were present at the same place where the session was organized in order to have a full technical support team and avoid any interruptions. The tasks and the templates to formulate the idea were shared beforehand with the teams and the entire process was led by the google design sprint expert.

As the goals to be achieved during the hackathon were preset, it helped the teams to think accordingly to formulate the idea. The specific tasks allowed the team to work on their ideas and gave them the flexibility to work together as a team. The ideas were later presented on Zoom platform. Zoom and MS Teams were the tools used for executing this fully online hackathon.

This event went smoothly as the tasks were predefined by the google sprint lead. There were some confusions in the beginning but overall, it was a success. The students were more connected with their teammates and were able to give successful business idea presentations.

2.2 **Methods**

2.2.1 *Ethnographic observation*

According to Brewer [9], “ethnography is a study of people in naturally occurring settings by means of methods which capture their social meanings, involving a researcher participating directly in the setting in order to collect data in a systematic manner.” The researchers used ethnographic observation during the hackathons in order to study the participants in the small-scale hackathon setting. The data was collected in a flexible and unstructured manner. The cumulative hours of observation were 60 hours for a sample of two different hackathons: hybrid and online. Ethnographic observation provided insights on the execution of the hackathon that took place during the phases of formation of the teams, problem solving, mentoring, preparation of the presentation, pitching of the ideas and jury evaluation.

2.2.2 *Questionnaire*

In addition to ethnographic observation, empirical data was also collected through a questionnaire. A questionnaire was developed to study and support the digital capabilities of educators and for the process of developing an online hackathon methodology. The questionnaire also evaluated the educators’ understanding of varied learning platforms and hackathons in general. The questionnaire was sent out to the educators from one Finnish HEI in order to recognize their digital capabilities, their understanding of hackathons and their experiences with the digital tools. In total, 49 answers were collected. The researchers obtained the consent of the participants prior to collecting the research data. The empirical data collected was carefully reviewed by the researchers.

3 **RESULTS**

3.1 **Hackathon experience**

The online and partially online (hybrid) hackathons became common during COVID-19 pandemic. The two aforementioned events encouraged wider participation, particularly from the participants of HEIs from three different countries–Finland, Estonia and Latvia. However, these events had their own drawbacks, especially the need to prepare more in advance because organizing online events is even more challenging compared to face-to-face hackathons. Overall, the events worked well. The lessons learned, and pros and cons of online events will be discussed in the coming section.

3.1.1 *Pros*

It is important to highlight the advantages and disadvantages of online or partially online events to ensure that future hackathon organizers benefit from our experiences. Documenting what worked well and what did not will provide valuable information to the organizers, which would help in making future events more successful. Below are some advantages of online and hybrid hackathons that we experienced.

Flexibility: One of the biggest pros of having the hackathon online is the flexibility to participate from anywhere and connect with anyone. This gives an opportunity to share, collaborate and develop ideas across different countries.

Digital skills development: There is a need to develop digital skills for work life. This also helps experience collaborations using online tools. This gives hands-on experience to the participants familiarizing themselves with different digital tools and platforms.

Networking: Online and hybrid hackathons provide an opportunity for participants to connect and network internationally, and to exchange ideas and develop them. It also allowed interactions from people from different countries and nationalities.

Cost efficiency: The online and hybrid events were quite cost effective compared to our previously held face-to-face hackathon, which was comparatively more expensive and required the organizers to rent space and organize the budget for food/drinks and other related expenses.

3.1.2 Cons

Many challenges were experienced by the organizers as well as the participants. Below are some cons of our online and hybrid hackathons:

Team formation: One of the biggest challenges that we experienced in the online hackathon set up was team formation. Networking online was quite challenging. It also depends on the participants' experiences and how familiar they are with the online team formation. However, in our case, forming teams was challenging. We anticipated these challenges and tried to solve it by matching the teams as per their interests before the hackathon.

Unfamiliar digital tools: Unfamiliarity with digital tools is one of the biggest hindrances to execute a smooth online hackathon. The Deal Room platform was new to the participants, which caused confusion and it took time to solve instant issues that are generally solved effortlessly in a face-to-face event. There were some technical difficulties faced by some participants during the hackathon. In some cases, the participants showed resistance to learning new tools due to the lack of time and training. A training session to train the mentors to conduct the online hackathon on Deal Room could have solved this challenge. Therefore, it is very important to offer training and familiarize the participants with new online tools and platforms beforehand. Once a more familiar tool like MS Teams was used, the participants collaborated smoothly. The moderator coordinated the overall process and connected with mentors and participants, and assisted in technical challenges.

Lack of IT support: Most universities do not have adequate IT support for different digital tools. IT support is vital to support mentors and participants during online events. Lack of equipment also causes hindrances in smooth execution of online hackathons.

Planning better: One of the vital tasks for organizing a successful hackathon is planning and delivering better instructions to the participants beforehand. It is important to devise a clearer and more defined path of instructions for them to follow. In the case of online hackathon, better instructions and templates were delivered to the participants, which resulted in the better execution of the hackathon as the participants had more clarity of the tasks.

Other challenges: We also experienced other challenges regarding lack of awareness of GDPR issues, not enough resources to support the digital tools, resistance to accept new digital tools, poor internet connection, in some cases, mismatches during collaboration due to differences in the use of tools in other HEIs and so on.

3.2 Questionnaire results

The development of an online hackathon methodology is a challenging task that requires a complete understanding of hackathon in general in addition to the varied learning platforms. In order to accomplish this task, educators' understanding of various learning platforms and their familiarity to hackathons were evaluated using a questionnaire. The questionnaire was developed in line with the aim of the study. In the following subsections, the empirical data collected through the questionnaire will be presented.

The respondents were asked about the most familiar learning platforms that they utilize to develop and maintain their community of practice. This item was asked to find out the familiarity of these tools while utilizing the hackathon methodology. It was found out that MS Office e-mail is the most widely used tool (87%) and MS Teams (66%) is also quite familiar to the educators. Moodle, (45%) LinkedIn (23%) are the next familiar tools among the educators.

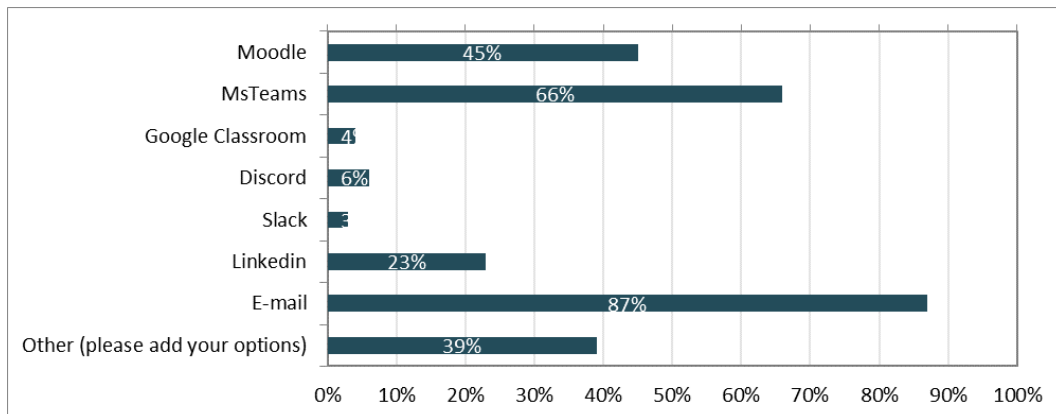


Figure 1. Most familiar learning tools for hackathon methodology

Figure 1 shows the most familiar learning tools among educators. The familiarity of the learning platforms must be considered while developing the hackathon methodology as unfamiliarity with the learning platforms can complicate the already challenging task of conducting an online hackathon. The results show that conducting the online hackathon on MS Teams can be a good option while tools like MS office e-mail and Moodle can also be utilized.

Table 1. Learning tools' rankings

	1	2	3	4	5	I do not use it	Average	Median
Moodle	7.2%	4.5%	17.1%	18.0%	30.7%	22.5%	4.3	5.0
Ms Teams	7.2%	11.7%	22.5%	28.0%	20.7%	9.9%	3.7	4.0
Google Classroom	3.8%	4.7%	4.8%	3.8%	4.8%	78.1%	5.4	6.0
Miro	3.9%	5.8%	7.8%	2.9%	5.8%	73.8%	5.2	6.0
Flinga	5.7%	5.8%	7.7%	7.7%	2.9%	70.2%	5.1	6.0
Discord	1.9%	1.0%	1.9%	4.8%	7.7%	82.7%	5.6	6.0
Slack	5.7%	2.8%	6.6%	6.6%	3.8%	74.5%	5.2	6.0
LinkedIn	7.3%	15.6%	24.8%	11.0%	12.9%	28.4%	3.9	4.0
E-mail	5.5%	7.3%	15.6%	19.3%	51.4%	0.9%	4.1	5.0
Other (please add your options)	11.1%	7.4%	5.6%	22.2%	35.2%	18.5%	4.2	5.0

Table 1 shows the preference of the educators in their use of learning tools in one Finnish HEI. As shown in Table 1, the least used learning tools were Discord (82.7%), Google Classroom (78.1%), Slack (74.5%) and Miro (73.8%). In addition, Zoom and WhatsApp are also preferred tools that have been used in teaching/learning.

Further, educators were asked about their experience of participating in online hackathons. 84% of the participants did not have any experience in participating in online hackathons. Even though Finnish educators are familiar with hackathons, the knowledge of online hackathons seems to be quite slim. Only few educators (7%) had participated in workshops on organizing hackathons or taken part in an online hackathon.

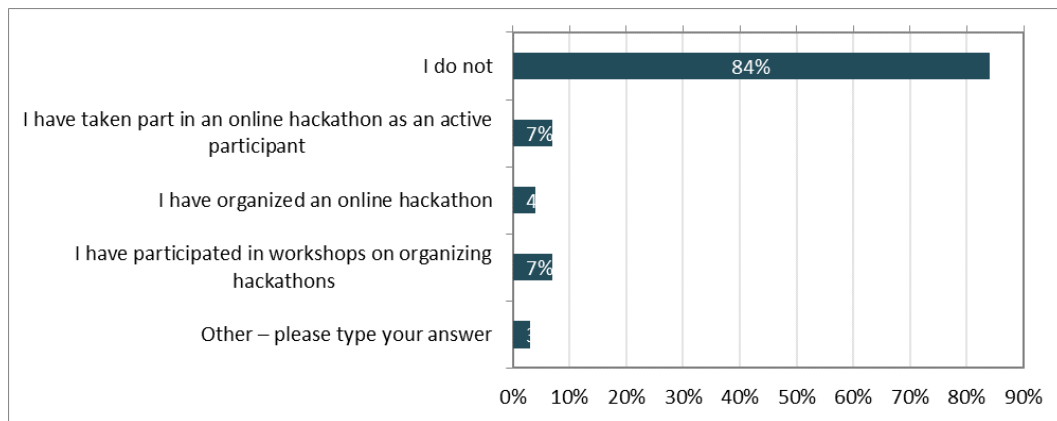


Figure 2. Experience of Participating in Hackathon

3.3 Towards an Online Hackathon Methodology - Hack-IT

During the COVID pandemic, hackathons were either held online or in hybrid formats. The online hackathons turned out to have very specific challenges for the participants, which were hardly experienced during face-to-face hackathons. Therefore, in order to overcome those challenges, educators realized the need for online hackathon methodology in higher education. The necessity for online hackathons and other digital methodologies during the pandemic led to the development of Hackathon and ICT-based Innovative Methodologies (HACK-IT) project, which was established after the educators experienced the online and hybrid hackathons. The unique challenges experienced during the pandemic encouraged the project partners to join forces and tackle the obstacles successfully.

HACK-IT project aims to create more flexible, inclusive, and secure technology enhanced open, digital education. It supports the digital capabilities of educators by developing an online hackathon methodology. The project establishes a strong partnership network to ensure digital readiness of the educators and advocates the enhancement of digital and pedagogical competences of the educators in order to ensure high quality teaching/learning. It aims to enable educators to implement and develop innovative practices in education in the digital era and develop a versatile approach to student learning. This expertise gained during the project will be shared across the partner HEIs to maximize the learning.

One of the Hack-IT project's Project Result (PR) is to focus on the creation of an online hackathon methodology, which would help in solving the challenges of the online hackathons. This online methodology would be tested in a pilot hackathon in order to ensure its effectiveness. This project is currently in its initial phase. The project partners have conducted the first survey regarding the choice of the online tools that would be utilized in the online hackathons. The decision about the choice of the online platform will be determined based on the survey results.

4 CONCLUSIONS

The aim of this research was to study online and hybrid entrepreneurial hackathons during Covid-19 pandemic. The international students from HEIs participated in these hackathons. The use of digital platforms made it possible to conduct these online events during the pandemic. The context of this study is a hybrid entrepreneurial hackathon, due to COVID-19 pandemic situation, where the students from a Finnish HEI participated in the process of business idea generation. This was followed by an online entrepreneurial hackathon which saw the participation of three different partner institutions across three countries –Finland, Estonia and Latvia. This research uses ethnographic observation to understand the transition from face-to-face to hybrid hackathon. The educators understanding of varied learning platforms and hackathons in general are evaluated using a questionnaire. The analysis of the data sheds light on the advantages and disadvantages of hosting online and hybrid hackathons. The results show that there are many pros and cons of organizing online hackathons. The pros include flexibility, digital skills development, networking and cost-efficiency. The most important disadvantages of online hackathons that were recognized during these hackathons included difficulties in team formation, challenge of unfamiliar digital tools, lack of IT support, planning and other challenges like lack of awareness of GDPR issues, lack of resources to support the digital tools, resistance to accept new digital tools, poor internet connection, in some cases, mismatches in collaboration due to differences in

the use of tools in other HEIs and so on. The analysis of the questionnaire showed that the most familiar learning platforms for participants for suggested online hackathon methodology were MS Office email, MS Teams, Moodle and LinkedIn. The results showed that conducting an online hackathon on MS Teams can be a good option while tools like MS office e-mail and Moodle can also be utilized. Further, the results show that participants did not have any experience in participating in online hackathons. This lack of knowledge and experience of participating in online hackathons show that there is a need to develop the online hackathon methodology, which is being addressed currently by the Hack-IT project.

ACKNOWLEDGEMENTS

The authors would like to express their gratitude to EU Erasmus+ funded project HACK-IT, Hackathon and ICT-based Innovative Methodologies for providing the valuable research material and opportunity to conduct the research.

REFERENCES

- [1] Vargo, D., Zhu, L, Benwell, B, Yan, Z. "*Digital technology use during COVID-19 pandemic: A rapid review*", Human Behaviour and Emerging Technologies vol. 3, no.1, 13-24. 2020.
- [2] Sun, L., Tang, Y., & Zuo, W. "*Coronavirus pushes education online*", Nature Materials, vol. 19, no. 6, 687– 687. 2020.
- [3] Maria, J. S, Sandro, S., "*COVID-19 and the Promotion of Digital Competences in Education*", Universal Journal of Educational Research, vol. 8, no. 10, pp. 4520-4528, 2020.
- [4] Massimo, U, "Hackathon as Emerging Innovation Practice: Exploring Opportunities and Challenges through 8 in-depth Case Studies" Polytechnico Milano 1863, 2017. Retrieved from <https://www.politesi.polimi.it/bitstream/10589/137237/5/Hackathon%20as%20Emerging%20Innovation%20Practice.pdf>
- [5] R. Khan, S. Mubarak, J. Luomakoski, and J. Heikkilä, "Students' Perception of Business Idea Generation: A Case of Entrepreneurial Hackathon," in Proceedings of 14th International Technology, Education and Development Conference, March 2nd-4th, pp. 1758–1764, 2020.
- [6] J. Thomas et al. , " Organizing a Collaborative Online Hackathon for Cutting-edge Climate Research", Weather, vol. 77, no. 9, pp. 221-226, 2022.
- [7] G. Briscoe, C. Mulligan. *Digital innovation: The hackathon phenomenon*. Working Paper 6. Creative Works, London, 2014.
- [8] Katarina, B. et al. "Interdisciplinary Online Hackathons as an approach to combat the Covid-19 Pandemic: Case Study", Journal of Medical Internet Research, vol. 23, no. 2, 2021. Retrieved from <https://www.jmir.org/2021/2/e25283/>
- [9] J.Brewer, *Ethnography*. Buckingham: Open University Press, 2000.