

A Perspective of Virtual Exhibition during the COVID-19 pandemic

Finta Lissimia¹, Lutfi Prayogi¹

¹ Architecture Department/Engineering Faculty, University of Muhammadiyah Jakarta, Indonesia
Email address of corresponding author: finta.lissimia@umj.ac.id

ABSTRACT

Virtual exhibitions are growing driven by physical restrictions during the COVID-19 pandemic. The exhibition of works that were previously more physical and can be visited physically is slowly becoming an exhibition that is visited virtually. This change is uncomfortable for the community. For this reason, a study is needed on the impact of virtual exhibition visits on the community during the COVID-19 restrictions. This study aims to answer these problems and, at the same time, evaluate the progress of virtual exhibitions in the early days of the pandemic. Collecting data using an online questionnaire on 49 architecture students. The questionnaire results were analyzed using distribution and content analysis for open-ended questions. Exhibition content is the main focus of a virtual exhibition. Other aspects to consider are virtual quality, exhibition perception, and execution. Restrictions cause boredom and stress. Virtual exhibitions can help overcome these feelings. Virtual exhibitions are not a substitute for physical exhibitions because people do not feel the need to refrain from visiting virtual exhibitions. Professionals feel motivated to visit any exhibition, whether physical or virtual. So virtual exhibitions function like physical exhibitions. The only difference is the impression and experience that visitors get.

© 2018 IJBESR. All rights reserved.

Keywords: restrictions, the pandemic, virtual exhibitions

1. Introduction

Architectural design is a product of designing and planning an environment's physical and spatial characteristics. The process involves social aspects and user behavior. The design of public areas, especially exhibitions, needs to consider user space preferences and experiences. The opportunity to experience space firsthand is very limited in the pandemic era. The exhibition can be carried out virtually by considering the space experience. The space experience at a virtual exhibition event is different from an offline exhibition event. In the COVID-19 pandemic situation, humans are required to adapt from real experiences to more virtual experiences.

Martin et al. [1] suggested that the COVID-19 pandemic demands changing learning methods

to virtual or online methods. This method encourages lecturers or teachers to be more proactive in conveying information. However, the evaluation results showed dissatisfaction among both students and teachers. For method improvement, Marti et al. [1] recommend several solutions, namely the use of visual and audiovisual media, increasing the database search function, tutoring with virtual media, and active methodologies.

Several studies have used virtual space as a medium for delivering information, interactions, or experiments [1][2][3]. Several studies have assessed the association of virtual reality with psychological health [4][5][6]. Williams & Howarth [7] examined the impact of the virtual environment on physical education. The results show that communication between students or students

and teachers has improved, and the discussion sessions for each session can be better. It can be concluded that the COVID-19 pandemic has had an impact on physical, social, and psychological aspects. The impact of the physical aspect can be avoided with a healthy and orderly lifestyle, keeping a distance, and washing hands. The social and psychological impacts of the COVID-19 pandemic require more efforts to be overcome.

Research related to social aspects is primarily done in education [1][2]. Other fields such as art have also experienced difficulties during the COVID-19 pandemic, especially in organizing exhibitions. Virtual media is used to organize exhibitions. Virtual media has advantages and disadvantages that need to be evaluated. The results of the evaluation can reveal aspects that can be improved. Key points in the exhibition space This study aims to assess the virtual exhibition space and its impact during the restrictions caused by the covid-19 pandemic.

Technological advances remove the boundaries of space. Architectural science that focuses on the design of physical space needs to adapt quickly to remain relevant today. The COVID-19 pandemic is forcing architectural practitioners to experiment. The Theory of Change emphasizes that change is not an organic result. Changes can be planned for long-term effects [11]. The relationship between humans and space needs to be studied further for architecture to adapt to technological advances. This research is the first step to identifying these issues and providing insight into virtual space's significance in the user experience.

2. Material and Methods

2.1. Virtual Exhibition Design Aspects

Virtual space is a space that includes space users to interact virtually [2]. The design aspects of virtual design that have been

discussed are sound and photorealistic. Rudi [3] in his research on virtual exhibition spaces. Sound is one of the main elements that define the virtual experience of the exhibition space. In designing a virtual exhibition space, the type and variety of sound in the room have an effect on the user's room experience. Less significant factors include exhibition design, quality, and sound delivery methods. Serafin [8] formulated six things related to sound in virtual spaces that support the user room experience, namely:

1. Voice Delivery Methods
2. Sound Movement
3. Interactivity
4. Diversity
5. Emphasis
6. Quantity

Dobricky et al. [2] researched virtual space as a learning medium for agricultural vocational schools. Teachers were asked to create a virtual garden. The teacher prefers a space that includes the user (interactive) than the user only as an observer (viewer). Therefore, interactive virtual spaces are more attractive as learning media than non-interactive ones. Proper placement of sound with appropriate variations is also important to support interactive users in virtual spaces [3][8].

2.2. The Psychic Aspects of Virtual Exhibition

The pandemic condition requires people to reduce socialization and stay at home. This condition gives rise to psychological stress [4]. Yang et al. [4]'s research comprehensively discusses virtual space as a solution to stress caused by a pandemic situation. Avoiding stress encourages affective responses of joy (enjoyment) and involvement (involvement). In contrast, the triggers for the affective response are telepresence and a sense of the present. Telepresence is an impression from time to time that is generated by a virtual space [4]. Telepresence focuses more on the user's impression, while the sense of presence relates to the virtual space experience [4]. Sense of

presence compares virtual space with real space, so the physical attributes of the space are essential. In terms of architecture, the sense of presence is more related to telepresence.

For this reason, this study will evaluate the virtual exhibition space. One way is by comparing the actual exhibition space. Sense of presence influences virtual space engagement, excitement, and satisfaction [4]. However, stress reduction is more influenced by telepresence than a sense of presence.

The natural atmosphere can reduce stress [5][6]. However, during a pandemic, access to natural elements is minimal. A virtual room with a nature theme can be a solution to reduce stress. Reese, Stahlberg, and Menzel [6] compared the effects of stress reduction in real and virtual environments. Post-activity measurements showed no significant difference between the stress level of visitors to the virtual and real natural environments. But over time, the stress-reducing effect was more influential on visitors to real natural environments. Reese, Kohler, and Menzel [5] conducted more detailed research on virtual spaces. They compared the ability of console and non-console themed virtual spaces to reduce stress. Parameters measured were stress, mood, and vitality before and after activities. The result is that stress levels decrease after activities, but the results only apply to non-console virtual spaces. There are indications that nature-themed virtual spaces are not suitable for user control.

2.3. Virtual Exhibitions Space

Höfler [9] philosophically formulates the critical success factors of virtual exhibition space design. These factors are:

1. Sensory quality. An excellent sensory experience can give rise to unexpected, precise, appropriate, and rich impressions.
2. Dialogue space. The ability of a space to communicate with users is the determinant of an excellent virtual exhibition space

3. Real sensation. Virtual exhibitions need to give users a sensation as real as possible. This is difficult to achieve because the real sensation is only obtained if the user sees and touches directly smells the goods or exhibition space.
4. Walk around. Circulation in the exhibition area is usually made comprehensive so that there are no exhibits that users do not have time to feel. This walking experience can support the virtual exhibition hall design
5. Haptic vision. Haptic is still related to sensors, namely how visitors do not just see but also feel, touch, and hold
6. Sense of Being Here. This factor may be like the notion of telepresence that has been described previously. So, it's natural that telepresence plays a more important role in reducing stress than a sense of presence

2.4. Methods

An appropriate research instrument is needed to answer the research objectives, namely the evaluation and impact of virtual exhibitions. The data collection method used an online questionnaire consisting of open and closed questions. Similar research that discusses media or virtual space using similar methods [1][2][7] Open-ended questions aim to explore the results of the evaluation. Respondents' answers will be categorized into the strengths and weaknesses of virtual exhibitions and their impact during the COVID-19 pandemic. In addition, it is necessary to know the comparison with physical exhibitions to answer whether virtual exhibitions can replace physical exhibitions. The following are the details of the questions asked in the online questionnaire.

Table 1: List of Question

List of Questions	Description	Type of Questions/ Answer
socio-demography	1. Email	short answer
	2. Name	short answer
	3. Age	short answer
	4. Gender	short answer
	5. Background profession	short answer
	6. How much do you follow architectural updates?	Likert scale
Strenghts and weaknesses of virtual exhibitions	What are the strengths/weaknesses of EPILOGUE?	open-ended question
	How did you feel during the restrictions implementation?	open-ended question
	What impact did you feel from visiting the EPILOGUE website on your experience during pandemic restrictions?	open-ended question
Preference to visit physical exhibitions or virtual exhibitions	I am more comfortable with attending physical exhibitions than virtual ones	Likert scale (strongly disagree/strongly agree)
	If I didn't have to then I would never attend the virtual exhibition	Likert scale (strongly disagree/strongly agree)
	I prefer to wait until the end of pandemic restrictions to attend physical exhibitions rather than visiting virtual exhibitions during the restrictions period	Likert scale (strongly disagree/strongly agree)

Source: (Author, 2021)

According to Cresswell [10], the number of respondents is five times the number of questions. So, the minimum number of respondents is planned to be 25 people. Answers to open-ended questions will be categorized and the distribution calculated to see which factor is dominant. The number of responses per scale will analyze Likert scale questions to see the most answers. The results of these analyzes are then compared with each other so that conclusions emerge from the

evaluation of virtual exhibitions and their impact during the covid-19 pandemic.

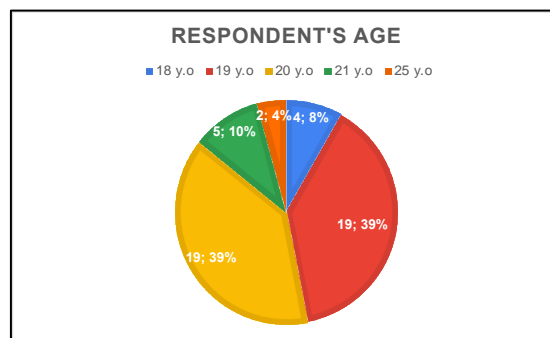
The exhibition that became the case study was an exhibition of the final work of Architecture students at the Bandung Institute of Technology. The exhibition takes place from 8 -30 June 2020. The theme of the exhibition is Phases/Cycles. This virtual exhibition can be accessed at www.epilogueitb.com.

This exhibition uses the metaphor of a plant from seed to bloom. The metaphor divides the exhibition material from the concept stage, drafting, to the result in the form of working drawings, mockups, and posters.

3. Results and Discussions

3.1. Sociodemography

The number of respondents is 49 people. Sociodemographic data in this study include: email, name, telephone number, age, gender, scientific background, and how much respondents follow developments in the world of architecture. The results of these data are as follows.



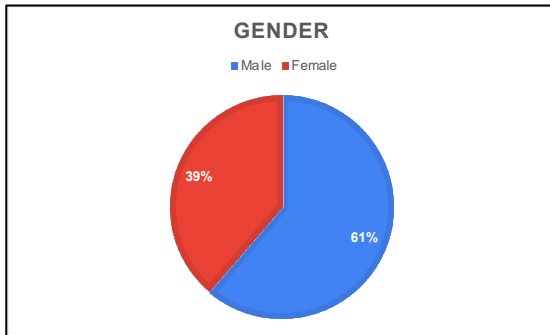
Source: (Author, 2021)

Figure 1: Distribution of Respondent's Age

The respondents aged 19 and 20 are the same, each with 19 people. Respondents aged 19 years amounted to 39%, as well as respondents aged 20 years. 10% of respondents are 21 years old, and 8% of respondents are 18 years old.

Respondents aged at least 25 years amounted to 4%.

There are more male respondents than female respondents. Male respondents totaled 30 people and represented 61% of respondents. Female respondents were 19 people and represented 39% of respondents.

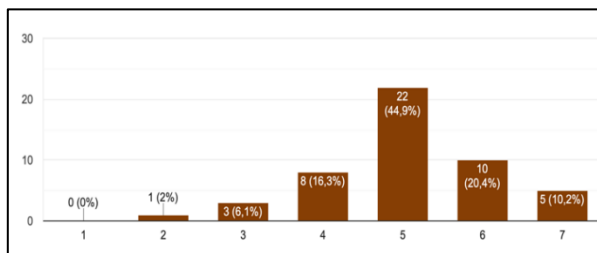


Source: (Author, 2021)

Figure 2: Distribution of Respondent's Gender

The scientific background or the respondent's profession is 100% from Architectural scholarship. All respondents are UMJ Architecture students who take Behavioral Architecture courses.

Most of the respondents feel pretty updated with the developments in the field of Architecture. The Likert scale in this question shows the highest score at 5 to 7. So, it can be concluded that respondents understand the content of the exhibition and theme better than respondents who do not follow updates in the field of architecture.



Source: (Author, 2021)

Figure 3: Respondent's Update on Architecture

3.2. Strength and Weakness EPILOGUE Virtual Exhibitions

The answers to the questions about the strengths and weaknesses of EPILOGUE are divided into two categories, namely Strengths and Weaknesses. The resulting content analysis details can be seen in Table 2: Responses on Strengths and Table 3: Response on Weakness.

Table 2: Responses on Strengths

Labels	Count of responses
content	49
execution	18
exhibition perception	17
virtual quality	16
website	13
insight	11
exhibition quality	10
impact	8
experience	8
practical	5
technology	2
design	1
exhibiton flow	1
Grand Total	159

Source: (Author, 2021)

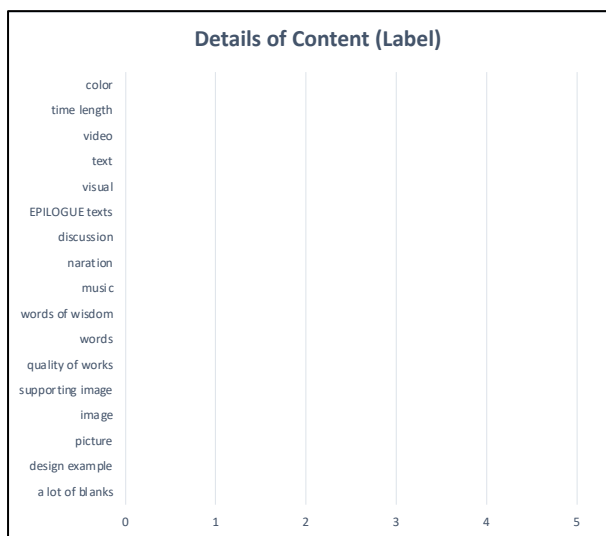
Most of the answers regarding the strengths of EPILOGUE lie in the content, exhibition execution, and the exhibition's perception in the visitors' eyes. Another strength of EPILOGUE worth considering is the virtual quality, website, insight, and exhibition quality. The content, execution of the exhibition, and the perception of the exhibition are closely related to the theme or concept of the exhibition and may be related to the background of the respondent from the architectural field so that they understand the content presented by EPILOGUE.

Table 3: Responses on Weakness

Labels	Count of responses
content	29
website	6
wanting	6
nothing	5
virtual quality	5
execution	4
confusing	4
overly	4
exhibition perception	3
exhibition flow	2
insight	2
Grand Total	70

In contrast to EPILOGUE's strengths, EPILOGUE's biggest drawback is content. The content is part of the EPILOGUE virtual exhibition and needs to be described in more detail. The description of the labels can be seen in the Details of Content (Label) chart. The lack of content comes from the quality of the video and the quality of the work. Virtual exhibitions are not yet joint, so the visual quality of virtual exhibitions has not developed rapidly. The quality of the work has been criticized because the work on display is Final Projects. Visitors with an architectural background who were updated in the world of architecture will focus more on exhibition works. The result of the Final Project may not be comparable to that of a great Architect.

Source: (Author, 2021)



Source: (Author, 2021)

Figure 4: Details of Content (Label) in Weakness

3.3. Impacts of Virtual Exhibitions during the Pandemic

Virtual exhibitions have become more existent since the COVID-19 pandemic. The imposition of access restrictions and physical distancing encourage the emergence of many virtual exhibitions. After two years, the pandemic is still ongoing. The virtual exhibition is growing in quality and quantity. Respondents need to

answer what they feel during the pandemic to find out the benefits of virtual exhibitions during the pandemic. After the answers are concluded, it can be analyzed the impact of virtual exhibitions on respondents during access restrictions and physical distancing.

Most of the answers regarding experiences during a pandemic are related to online studies.

This experience is closely related to the respondent's status as a student.

Table 4: Responses on experience during the Pandemic

Labels	Count of responses
online study	52
restricted	29
boring	29
interaction	14
meaning	9
adaptation	8
economy	5
negative change	4
experience	3
health protocol	3
anxiety	2
covid	2
grief	1
positive	1
Grand Total	162

Source: (Author, 2021)

The following most experienced are labeled restrictions. Respondents felt that everything was limited in mobility, activities, interactions, routines, and even leaving the house. The most common emotion is boredom. At the beginning of 2020, there were strict restrictions in Indonesia, so no one was allowed to leave the house unless it was urgent. Offices were closed, no one was allowed in, and employees were required to work from home (WFH). The education sector is also limited. There should be no activities in schools at all. In June 2020, the restrictions lasted for approximately three months. The other experiences that came up the most were labeled interactions. Humans as social beings have a basic need for interaction. Restrictions have a significant impact on meeting these needs.

The virtual exhibition as one of the products of the pandemic period is expected to help reduce the personal impact felt by the community. The

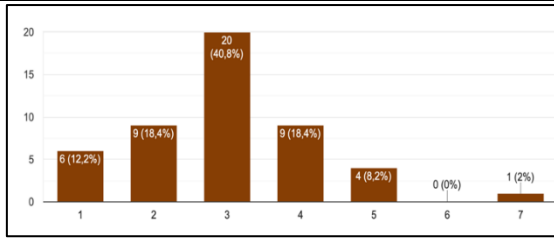
actual impact of virtual exhibitions during the pandemic can be analyzed based on the following table.

Table 4: Impacts of virtual exhibitions during the pandemic

Labels	Count of responses
motivated	25
entertained	23
insightful	21
helping to come to terms with the pressure of restrictions	19
experiences	17
health protocol	4
hopes	2
doubtful	6
Grand Total	117

Source: (Author, 2021)

The virtual method does not reduce or replace the function of physical exhibitions, namely to inspire visitors, provide entertainment, and add insight. The virtual exhibition motivates the respondents to create. The motivation may be closely related to the respondent's background following the exhibition material, which is architectural design. Virtual exhibitions help overcome the stress or boredom caused by restrictions during the pandemic. This impact is not as significant as other impacts, which are the same as the impacts caused by physical exhibitions. It can be concluded that the virtual exhibition helps to overcome the pressure of the pandemic restrictions but does not eliminate the main expected impact of any exhibition.



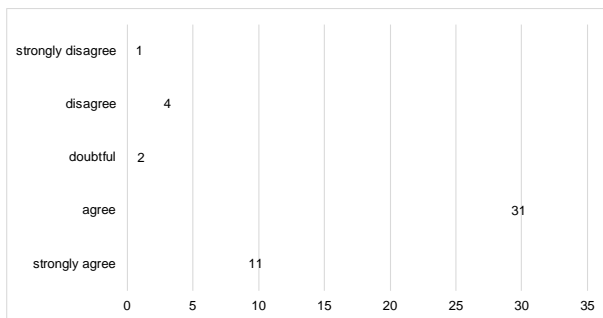
Source: (Author, 2021)

Figure 5: Respondent's Answer on How often they leave the house during Pandemic's restriction

The restrictions imposed around June 2020 can be seen in the low opportunity for people to leave their homes. From the chart of answers to the question of how often respondents leave the house during the restrictions, the values that appear are shallow. Restrictions and boredom are experiences that are highly relevant to the lack of opportunities to leave the house. Those experiences are felt by respondents or the community in general.

Questions regarding the virtual exhibition experience are broken down into three questions. Respondents were asked to give a scale of 1-5 for each of the following statements:

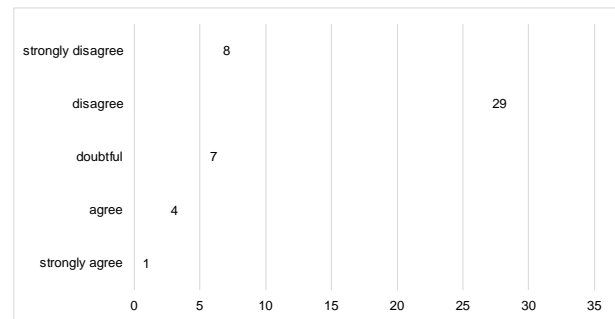
1. I am more comfortable with attending physical exhibitions than virtual ones
2. If I don't have to, then I will never attend the virtual exhibition
3. I prefer to wait until the end of restrictions to attend physical exhibitions rather than visiting virtual exhibitions during the restrictions period



Source: (Author, 2021)

Figure 6: Responses on feeling better attending physical exhibition rather than virtual

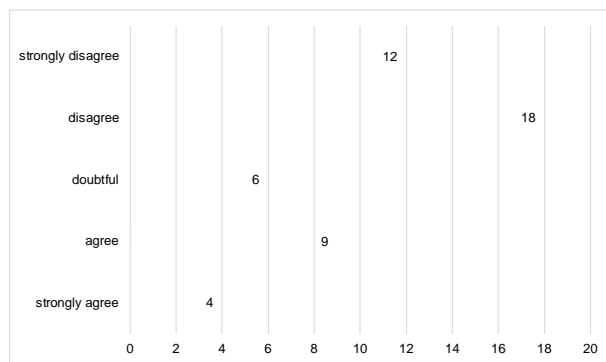
The first question compares physical exhibits with virtual exhibits. The results show that 84% agree with the statement. This can be due to several factors, including habits or things that are lacking in virtual exhibitions. Content quality is not optimal, which is the main reason virtual exhibitions cannot replace physical exhibitions. Content quality, execution, exhibition perception, and virtual quality can be the key to the strategy to increase the virtual exhibition space so that it can at least match the physical exhibition.



Source: (Author, 2021)

Figure 7: Responses on obligation to attend virtual exhibits

Virtual exhibitions are not considered a substitute for physical exhibitions. This is evident from the low number of respondents who feel compelled to attend virtual exhibitions. The rapid development of technology has supported the various design possibilities of virtual exhibitions. The live virtual exhibition improves the quality according to the key points that have been generated in the previous analysis.



Source: (Author, 2021)

Figure 8: Responses on preference to visit physical exhibitions after restrictions rather than visiting virtual exhibitions during restrictions

The third question confirms the results of the second question. WFH is not an excuse for people to visit virtual fairs. These results are consistent with the analysis of the impact of virtual exhibitions on the restrictions during the pandemic. Most respondents did not feel the need to wait for the restrictions to end to visit physical exhibitions. This means that the existence of virtual exhibitions does not depend on the existence of physical exhibitions.

4. Conclusion

The EPILOGUE virtual exhibition has many strengths, including content, execution, exhibition perception, virtual quality, website, insight, and exhibition quality. The biggest drawback of the EPILOGUE virtual exhibition is the content. Content is the main focus of the success of virtual exhibitions, especially if visitors come from the same background, namely architecture. Moreover, most of the respondents admitted to following the development of architecture.

Restrictions during the pandemic created new problems. Problems closely related to students are online learning methods, restrictions, boredom, and lack of interaction. Visiting virtual exhibitions, especially those that match interests or professional fields, will create

motivation to work. Other impacts of visiting virtual exhibitions during pandemic restrictions are entertaining, insightful, helping deal with stress during restrictions, and providing a unique experience.

Virtual exhibitions cannot be seen as a substitute for physical exhibitions. Both have different characters. Most people still feel more comfortable attending physical exhibitions than virtual ones. In contrast, this does not mean that visiting virtual exhibitions is a must. People also prefer to visit virtual exhibitions at any time rather than wait for restrictions to end so they can visit physical exhibitions.

Acknowledgement

This research was funded by Lembaga Penelitian dan Pengabdian Masyarakat (LPPM) University of Muhammadiyah Jakarta

References

- [1] Torres Martín, C., Acal, C., El Honrani, M., & Mingorance Estrada, Á. C. (2021). Impact on the Virtual Learning Environment Due to COVID-19. *Sustainability*, 13(2), 582.
- [2] Dobricki, M., Kim, K. G., Coppi, A. E., Dillenbourg, P., & Cattaneo, A. (2021). Perceived educational usefulness of a virtual-reality work situation depends on the spatial human-environment relation. *Research in Learning Technology*, 29.
- [3] Rudi, J. (2021). Designing Soundscapes for Presence in Virtual Reality Exhibitions: A Study of Visitor Experiences. *Visitor Studies*, 1-26.
- [4] Yang, T., Lai, I. K. W., Fan, Z. B., & Mo, Q. M. (2021). The impact of a 360° virtual tour on the reduction of psychological stress caused by COVID-19. *Technology in Society*, 64, 101514.
- [5] Reese, G., Kohler, E., & Menzel, C. (2021). Restore or get restored: The effect of control on stress reduction and restoration in virtual nature settings. *Sustainability*, 13(4),
- [6] Reese, G., Stahlberg, J., & Menzel, C. (2021). Digital shinrin-yoku: Do nature experiences in virtual reality reduce stress and increase well-being as strongly as similar experiences in a physical forest?. Preprint
- [7] Williams, J., & Howarth, K. Learning pains: practical considerations in migrating exercise physiology labs to a virtual environment during the COVID-19 pandemic. *The FASEB Journal*, 35.

- [8] Serafin, S. (2004) Sound Design to Enhance Presence in Photorealistic Virtual Reality. Proceedings of the 2004 International Conference on Auditory Display, Sidney, Australia
- [9] Höfler, C. (2021) Image Contact Haptic Actions in Virtual Spaces. *Game|World|Architectonics*, 217.
- [10] Creswell, J.W. (2003). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. California: SAGE Publications, Inc.
- [11] Drabble, D., Simeone, L., Iacopini, G., Morelli, N., & De Götzen, A. (2021). Applying Theory of Change to strategy articulation cycles in design projects: Potentials and shortcomings through the Designscapes case study. *Strategic Design Research Journal*, 14(2), 438-455.