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Carrying the Burden of Innovation in Education: Becoming Educational Events Organizers in Social Virtual Reality

Abstract

Recent laboratory-based research increasingly explores the use of virtual reality (VR) technology in education. While these studies confirm the potential of VR tools, they often overlook the challenges educators encounter in real-world implementation, potentially hindering the broader adoption of VR. Our study employs collaborative and analytic autoethnography of five educational event organizers in social VR to address this gap. We identified limitations in the use of social VR related to discomfort and low accessibility of head-mounted displays, the non-inclusivity of platform features, the risk of reduced educational content quality,

and the need to acquire new digital skills. Organizers experienced significant responsibility and stress from managing technical and formal issues, impacting their well-being and increasing workload. Nevertheless, they also reported a strong sense of purpose and personal development, which reinforced their academic identity. Despite the challenges of organizing events in this immersive environment, organizers experienced significant professional growth. Their involvement not only enhanced their skills but also fostered valuable collaborations across academic institutions, cultivated community, and promoted inclusivity in education. To address social VR limitations in higher education and mitigate negative impacts on organizers, the authors provide recommendations for educators.

K e y w o r d s: innovation, autoethnography, social VR, virtual reality, education

Introduction

In the face of dynamic technological shifts and the growing need for innovation in education, educators and professionals in this field are confronted with the challenges of implementing novel solutions (Mukul & Büyüközkan, 2023). Recent studies have increasingly highlighted the potential of utilizing virtual reality (VR) technology in education (Di Natale et al., 2020; Abramczuk et al., 2023). Its use can enhance the effectiveness of learning (Wu et al., 2020; Pyrkosz-Pacyna et al., 2024), engagement with content (Nesenbergs et al., 2021) and motivation (Allcoat & Mühlenen, 2018). These effects stem from the distinctive features of VR technologies, including an immersive 3D environment, the synchronization of users' physical bodies with their digital counterparts, a heightened sense of presence (defined as the illusion of unmediated existence within the virtual environment) enabled by a first-person 360-degree perspective, and the ability to share the same virtual space with other users (Mystakidis, 2019, 2022; Mystakidis et al., 2021; Wu et al., 2020). VR enables simulations of scenarios that are inaccessible in the physical world (due to the safety, economical, institutional or other constraints), thus enhancing the learning experience (Radianti et al., 2020).

Currently, especially since the COVID-19 pandemic, there is growing interest in the social aspects and educational potential of social VR platforms (Lin & Latoschik, 2022; Wei et al., 2024; Dey et al., 2024). Social VR platforms facilitate avatar-mediated communication, enabling meetings and collaboration in 3D virtual environments (Lin & Latoschik, 2022). Previous research shows that communication in social VR can enhance users' sense of social and spatial presence, facilitate their focus on conversations, and support individuals who are introverted, shy, or marginalized (Wei et al., 2024; Maloney et al., 2020). Avatar-

mediated communication in social VR allows for natural interactions between users by enriching communication with non-verbal cues (e.g., gestures, eye contact; Wei et al., 2024; Maloney et al., 2020) and facilitating informal interactions among users, such as the formation of smaller discussion groups, as noted by Mulders and Zender (2021). Social VR environments facilitate 'authentic, simulated, cognitively challenging experiences in engaging, motivating environments for open-ended social and collaborative interactions and intentional, personalized learning' (Mystakidis et al., 2021). These platforms can increasingly be accessed not only through head-mounted displays (HMDs) but also via desktop devices, making them more widely adopted in educational contexts (Mystakidis et al., 2021; Mystakidis, 2022; Waligórski et al., 2023).

Introducing technologies such as social VR into education represents a significant innovation. However, this complex process extends beyond developing new tools, requiring a critical analysis of their impact on educational structures, roles, and emerging challenges. Furthermore, innovation requires adaptation to new practices and the overcoming of technological, social, and psychological barriers. Identifying a solution that ensures both technical and economic accessibility is particularly challenging in the educational sector. This endeavor begins with an examination of the psychological determinants of effective and comfortable communication, which is essential for developing a viable solution. Despite the identified advantages and growing interest in VR in educational research, the widespread adoption of VR in this area remains limited (Al Farsi et al., 2021). We argue that this limitation might arise from the challenges associated with implementing these technologies by educators rather than from their inefficiency. To address these challenges, there is a critical need for research focused on the real-world practices of VR implementation. Moving beyond controlled laboratory settings, research must account for the actual conditions in which these technologies are applied.

This research aims to fill the existing research gap. We investigate the process of organizing two educational events in social VR from a participatory perspective , examining the challenges of their practical implementation. Drawing on our shared experiences and identified gaps in the literature, we posed the following research questions (RQs):

RQ1. What limitations do organizers perceive in using social VR platforms for organizing educational events?
RQ2. What strategies can help reduce these limitations?
RQ3. What challenges do organizers face when organizing educational events in social VR?
RQ4. How does organizing educational events in social VR affect the psycho-physical well-being of the organizers?
RQ5. What strategies can help reduce factors negatively affecting the organizers?

To address these research questions, we employ the collaborative and analytic autoethnography approach (CAAE) proposed by Acosta et al., (2015). Our findings offer both theoretical and practical contributions. On the one hand, they align with the principles of action research, which seeks to identify areas for improvement, actively engage in practices, and aim to enhance them. On the other hand, they advance knowledge by identifying discrepancies between empirical data on VR implementation practices and the theoretical understanding of VR's effectiveness. Ultimately, the choice of this method is driven by the need to fill the research gap concerning the experiences of those implementing VR tools in education, specifically the organizers of educational events, a highly underexplored topic in studies predominantly focused on participant and student experiences.

In the following section, we describe the framework of CAAE employed in this study. We provide context for our research by discussing the *Wirtualium* project and our roles as its organizers. Subsequently, we outline our research design, including data collection and analysis. In the Results section, we examine the experience of organizing the *Wirtualium* project in social VR, the challenges encountered during this process, and the impact of implementing these innovations on the organizers. In the final section, we offer recommendations for organizing educational events in social VR.

Methodology

In our study, we adapted CAAE framework (Acosta et al., 2015) to investigate the challenges and limitations experienced by us, the organizers, in the process of implementing social VR platforms for educational event organization. The CAAE framework is characterized firstly by its systematic nature, ensured through clearly defined research questions and transparent research methods. Secondly, it adopts a problem-based approach, focusing on real-world practices where practitioner-researchers become both the subject and the object of the research. Thirdly, it is cyclical, implying that solutions developed within one research cycle should be tested in future cycles. CAAE combines analytic (Anderson, 2006) and collaborative (Chang et al., 2013) approaches to autoethnography. This enhances research quality through methodological transparency and the dialogic conduct of autoethnography within a research team. In this framework, autoethnography serves as a technique used in participatory action research, enabling reliable investigations of the organizers' own experiences. The goal of practitioner-researchers is to leverage insider perspectives to improve the quality of future actions and advance academic theory.

We adopted this approach because it allows for a systematic and transparent examination of practices within a research team. The organization of educational events is typically a collaborative effort, where individuals in different roles perceive the process differently and encounter various challenges. CAAE facilitates dialogic autoethnographic research that, by incorporating multiple perspectives, captures a more comprehensive view of the phenomenon under study.

The Wirtualium Project

In our study, we collected data during the process of organizing the third edition of the educational project *Wirtualium*. Data was recursively collected and analyzed over the period of four months - April to July 2024. The *Wirtualium* project was initiated in 2022. Its aim was to create a space for academic discussion about VR among researchers from various scientific disciplines, to invite participants to a personal experiment related to attending a scientific event in VR, to explore the potential of these platforms in academic communication, and to popularize an evidence-based approach to using VR. In 2022, *Wirtualium 1.0* hosted the first entirely social VR-based scientific conference in Poland, on the AltspaceVR platform. This national event became one of the most significant VR-related conferences in Poland, earning the title of Conference of the Year 2022 in the national StRuNa (Student Scientific Movement) competition. The second edition was held on the Spatial (social VR) platform.

During the organization process of *Wirtualium 3.0* (17–18 May 2024), which is the subject of this study, two events were held entirely on the Spatial platform: the next edition of the scientific conference and educational workshops on VR and new technologies for high school students – Summer VR Academy (see Figure 1). The academic conference featured 25 presentations, with 7 keynote speakers delivering lectures, and around 90 participants attended the event. The Summer VR Academy hosted 9 teams, each consisting of 3 students and a supervisor. This event included two lectures, and three workshops conducted on the Spatial platform.

Spatial is a social VR platform that allows for the design and usage of VR environments. It enables social interactions and collaboration via customizable avatars in shared virtual environments. This platform supports voice and text communication as well as screen sharing. Typical usage of Spatial includes remote work, education, training, and entertainment. Spatial offers support for HMDs as well as access through desktop and mobile devices.

The authors of this study hold key roles in organizing *Wirtualium 3.0*, four of them have been involved in organizing the project in previous years (see Table 1). The motivations for conducting the *Wirtualium 3.0* project and previous experiences of organizers are described in the section *Motivations for Co-Creating the Project*.

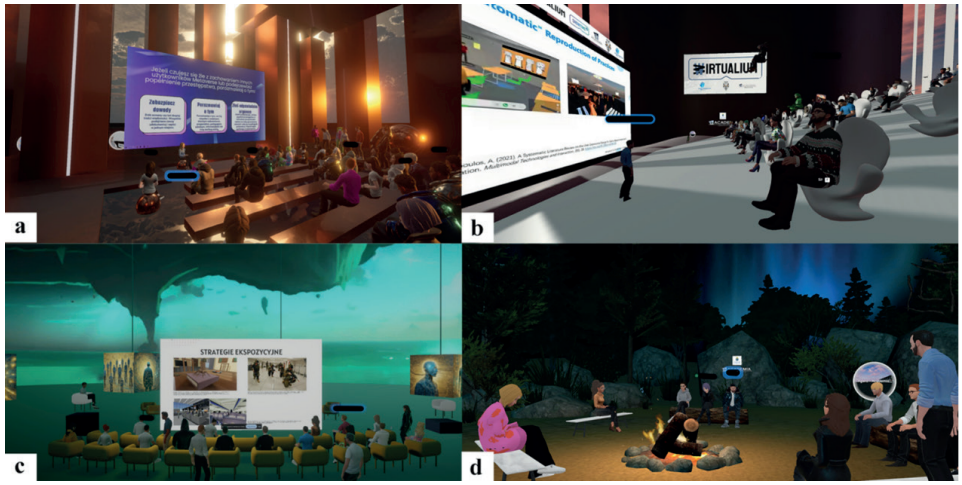

Figure 1. Photographs from the Wirtualium 3.0 in auditoriums of Academia Electronica: (a) workshops during the Summer VR Academy, (b-c) presentations at the academic conference, (d) a social gathering by the bonfire following the conference.

S o u r c e: Own work.

Table 1
Basic information about the organizers-authors

Name	Role in the *Wirtualium* Project	Gender	Year Joined
Jan	Founder and head of the project. His responsibilities included coordinating the entire team's work, setting goals, representing the project, and handling formal matters. He was also the initiator and co-organizer of the entire process of organizing the *Wirtualium*.	Male	2022
Sylwia	Coordinator of administrative tasks, such as developing statute and application forms, designing schedules, and being involved from the beginning in the conceptual development of the project. She also served as a panel moderator during the conference.	Female	2022
Aleksandra	Coordinator of the team responsible for receiving participants' submissions, delivering certificates, and collaborating with the Scientific Committee during submission reviews. She also served as a panel moderator during the conference.	Female	2023
Zosia	Coordinator of the team responsible for collaborating with keynote speakers, from sending invitations to providing support during the conference. She also served as a panel moderator during the conference.	Female	2023
Jowita	Member of the Scientific Committee and head of the EduVR-GameLab research laboratory, which was a unit where *Wirtualium 3.0* project was affiliated. Her responsibilities included evaluating submissions and collaborating with university authorities. She also served as a panel moderator during the conference.	Female	2024

S o u r c e: Own work.

Research Design

We began by formulating research questions (RQs), which we posited collectively through discussions about our experiences with implementing VR in education and being VR researchers. The first author facilitated the entire research process, serving as the moderator and leader. We jointly established the course and scope of the research and developed a structured self-interview form to systematize the autoethnography process (Appendix S1). The first sheet of the form addressed retrospective experiences. It included questions about motivations for organizing the project, experience in organizing educational events, and the use of social VR platforms, as well as their impact on the individual's academic identity. The second sheet contained questions about the experiences related to the activities undertaken by the organizer in the previous week. These questions pertained to the tasks performed, identified limitations of social VR platforms, challenges associated with organizing the event, recommendations for reducing these challenges and limitations in the future, and the impact of these activities on the organizer. The second sheet was filled out weekly for six weeks (April–May 2024), with each version containing the same questions. Some individuals who did not engage in organizational activities in a given week did not complete the self-interview for that week. The collected data was in Polish.

We conducted data analysis utilizing the approach rooted in grounded theory (Oktay, 2012). An inductive coding method was applied. Thematic analysis was independently conducted by two researchers utilizing MAXQDA 24 software. Subsequently, the independently developed code trees were compared to establish the scaffold of the report. The synthesis of the two analyses' results was carried out during the report preparation stage. The report was then reviewed by the entire research team, followed by an asynchronous discussion on the conclusions. Based on this discussion, corrections were made to the report.

Data source triangulation was ensured through the use of structured autoethnographies conducted simultaneously by five researchers holding different roles in the project, second-person dialogic discussions during the project implementation, and continuous references to other scientific studies from the research design phase, through the self-interviews, to the report preparation. Additionally, to ensure high-quality data analysis, it was conducted independently by two researchers and subsequently verified by the entire team.

Limitations

Despite ensuring data triangulation and systematizing the autoethnography process, the generalizability of the conclusions in this article is limited by the exploratory and interpretative nature of the research and the study's scope, which

was confined to the organization of two related events. These conclusions pertain to the first-person experiences of five researchers situated in specific cultural, social, gender, and professional contexts. To mitigate this limitation, the report includes numerous references to studies conducted by other researchers. The cyclical feature of CAAE invites other researchers to examine the recommendations in different research contexts.

Our study focuses on the organization of national-scale events, which means some challenges related to the use of social VR for organizing international educational events may not have been identified. Additionally, certain formal challenges are specific to European Union member states and may differ in other parts of the world, or even within different institutional affiliations of events. The interviewers had other professional responsibilities, which affected the volume of the self-interviews across different weeks and among different individuals. To reduce the impact of this on the analysis results, an additional asynchronous discussion was conducted based on the report, where participants could supplement their perspectives.

Results

Becoming an Organizer of the *Wirtualium* Project

Our research team members played pivotal roles in the organization of the *Wirtualium 3.0* project, encompassing both organizational and substantive coordination (see Table 1). During the project's organizational process, we utilized telecommunication tools, including social VR platforms. We possessed extensive experience in organizing educational events. Members of our team had previously organized both in-person and online academic conferences. One of us had organized educational events within desktop virtual environments (Second Life), while the other had coordinated a discussion panel on a social VR platform (Big Screen). Our prior experiences, including those associated with organizing previous editions of *Wirtualium*, significantly influenced the organizational process of *Wirtualium 3.0*. These experiences aided us in planning and recognizing the differences in organizing and participating in educational events utilizing various organizational forms.

Motivations for Co-Creating the Project The primary source of motivation for organizing *Wirtualium* stemmed from our research interests in VR technology. We perceived the opportunity to co-create this project as a chance for both personal and social development. On a personal level, we recognized the potential to enhance our competencies in utilizing VR technology, expand our network of

contacts, and strengthen our academic identity. On a social level, we identified the event's transformative potential to improve communication quality and create a new space for interdisciplinary academic discourse on VR. Our desire to create the project was further influenced by its experimental nature. This experimental aspect was understood, on one hand, as an invitation for participants to engage in a personal experiment with social VR, and on the other, as an innovative attempt to adapt futuristic visions of VR technology into practical applications.

> "The opportunity to observe how technological concepts, which were previously the domain of futurists and science fiction literature, are becoming reality also compelled me to participate in the organization of *Wirtualium*" (Sylwia)

Recognizing the Potential of Social VR Platforms A crucial source of motivation for undertaking the organization of the *Wirtualium* project was our diverse reflections on both the potential of social VR platforms and the drawbacks of popular online communication tools, such as videoconferencing software. We perceived the greatest potential advantage of social VR platforms over video communicators in their ability to foster a sense of co-presence:

> "These types of meetings promote a feeling of 'community,' which can be particularly important for individuals who, for various reasons, cannot participate in academic life in the traditional manner." (Aleksandra)

> "Through the experience of embodiment and presence in a virtual space, participants can feel as though they are truly together with others, which enhances interaction." (Sylwia)

Similarly, Wei et al., (2024) highlights the stronger effect of social presence in social VR compared to video communicators. Co-presence mediated by avatars simultaneously allows to maintain the comfort of partial anonymity:

> "What I value most is that I can fully experience the conference (in the sense of feeling like I am together with other participants in one place) without the pressure to turn on my camera and sit 'on alert' – I feel that social VR can really facilitate the assimilation of educational content by alleviating some of this pressure." (Aleksandra)

Research by Barreda-Ángeles and Hartmann (2022) also suggests that avatars and nicknames can enhance the sense of anonymity, potentially increasing comfort and the willingness to interact with others.

In social VR, we can create virtual spaces tailored to the needs of our events, which are typically more cost-effective than renting physical venues. Moreover, we believe that social VR embodies the advantages characteristic of other forms of online events, such as the elimination of travel requirements, the associated reduction in carbon footprint, the lowering of participation costs, and increased accessibility for certain social groups (Bray et al., 2022; Niner & Wassermann, 2021). Recognizing the potential of social VR platforms, through introspective reference to our own experiences and knowledge, was an important source of motivation for organizing *Wirtualium*. However, the principal aim of this study is to identify the challenges inherent in the implementation of VR technology. Consequently, the following sections will predominantly concentrate on these challenges.

RQ1 & RQ2 | Limitations of Social VR Platforms in Organizing Educational Events

Comfort and Accessibility of HMDs A fundamental limitation and potential source of technological exclusion during events organized in social VR, in our view, is access to HMDs. The issue of technological exclusion related to access to VR technology in education has also been noted by Jensen and Konradsen (2018) and Alalwan et al., (2020). Within our research team, only two individuals had a consistent access to HMDs. However, this primarily represents a barrier to accessibility for event participants. Furthermore,

> "some social VR platforms are compatible only with specific HMDs (e.g., Spatial is compatible solely with Meta Quest 1, 2, 3, and Pro), which further reduces the accessibility of the event." (Jan)

The degree of this limitation may vary depending on the target audience. For instance, among individuals with an interest in VR, one might anticipate greater accessibility to HMDs. However, even within this demographic, studies have shown limited usage. Le et al. (2020) observed that only 19% of participants in the conferences they examined used HMDs, while Waligórski et al., (2023) reported a usage rate of merely 11.9% among their respondents.

A partial solution to this issue, which we implemented during *Wirtualium 3.0*, was the use of the Spatial platform, which is compatible with both HMDs and non-VR devices, such as smartphones and computers. We recommend this solution for another reason as well – using HMDs during multi-hour events can cause significant discomfort and fatigue (Moreira et al., 2022; Mulders & Zender, 2021). The ability to switch to a non-VR device can serve as a form of rest, as well as an alternative for those who either do not wish or are unable to use HMDs.

Sá et al., (2019) note that concentration problems are a major limitation of events conducted via video communicators. On the one hand, the immersiveness of HMDs reduces the influx of stimuli from the physical environment, which could address this issue (Wei et al., 2024). On the other hand, our experiences indicate that HMDs' immersiveness can become problematic in situations where multitasking is required. In our case, we observed that this presents a risk of excluding individuals who are unable to dedicate their full attention to the event's content, such as those with caregiving responsibilities. This feature of HMDs also creates difficulties in taking notes during events or using outlines during presentations (Waligórski et al., 2023).

We believe that using social VR platforms that support both VR and non-VR devices can reduce these barriers. However, we recognize that new problems may arise in communication between individuals using VR and non-VR devices. These issues begin with differences in platform interfaces. For example, VR users on the Spatial platform do not have access to text chat, which proved indispensable for desktop users in cases of microphone issues or reluctance to turn it on. Problems also arise directly in interactions:

> "I previously participated in a conference in VR. I noticed a significant difference between these situations [this year I used a PC]. It was difficult for me to fully engage, but the bigger problem was the sense of dissonance: I was aware that the keynote speaker of the session I was leading, who participated in the event in an HMD, perceived the event completely differently than I did. From his perspective, I was standing next to him, looking at him, sharing the space with him. Meanwhile, my perspective was entirely different: I viewed the situation as if 'from above.' I felt that there was something inauthentic about it, which hindered full communication." (Jowita)

In recent years, extensive research has been conducted on communication between users utilizing HMDs (Wei et al., 2024) and between users of desktop virtual worlds (Kim et al., 2012). However, the area of interaction between VR and non-VR users remains highly underexplored. Meanwhile, reflection on our organizational practices leads us to recommend implementing such solutions to enhance participant comfort and event accessibility. Further research employing alternative methodologies is essential in this area.

A Cascade of Issues Related to Technological Accessibility Our experiences, however, have demonstrated that the issue of accessibility in educational events conducted within social VR environments may, in practice, be considerably more extensive than initially anticipated, owing to a variety of latent factors. Internet-related problems arose consistently throughout *Wirtualium 3.0*. Reports of these issues came to us from both school teams and individual conference participants,

including those using VR and non-VR devices. These problems also directly affected us as organizers, despite numerous attempts to mitigate them:

> "Personally, as an active participant and panel moderator, I too experienced issues related to the Internet and microphone, despite prior tests and familiarity with the platform. (Sylwia). The poor quality of Wi-Fi in schools and public institutions complicates the use of HMDs in social VR – not to mention the lack of VR-dedicated routers." (Jan)

We used to understand VR as a technology that transcends geographical barriers in communication (Kenyon et al., 2023, Moreira et al., 2022). However, the process of organizing *Wirtualium 3.0* with a team whose members were located in different countries demonstrated that communication in social VR can also have limitations based on the user's location:

> "Until I traveled to China, I had not realized that there are regions where certain social VR platforms cannot be used. Previously, I believed that communication via VR was free of territorial restrictions. However, I discovered that there are technologically advanced places where using the platforms and Meta goggles we employ in online mode is impossible. Moreover, even the desktop version is difficult to use." (Jowita)

The creators of the Spatial platform recommend the use of high-specification equipment. However, during *Wirtualium 3.0*, we did not encounter significant problems in this regard, either from individual participants or school teams, who often lacked access to fully compliant devices. We are aware, though, that hardware requirements on some social VR platforms are significantly higher compared to video communicators.

> "In previous editions of the conference, I encountered technical issues related to the limited RAM of my computers. I frequently had to switch computers to connect to the platform, facing numerous input device problems, such as microphones, which greatly hindered my communication and the smooth conduct of the conference. It was only during the latest edition, when I used the newest, optimized version of the Spatial platform via a browser, that the platform did not strain most of the computers I used, which greatly facilitated the organization and flow of the event." (Sylwia)

When organizing educational events in social VR, attention must also be given to the accessibility of available HMDs and VR platforms for individuals with disabilities (Wei, et al.,2022; Maloney & Freeman 2020). The full VR experience excludes individuals with complete visual and hearing impairments, but also those

with partial sensory impairments (e.g., limited stereoscopic vision or auditory processing disorders). Interaction with VR platforms predominantly rely on finger, hand, arm, and head movements, or posture tracking, which can be a barrier for individuals with mobility impairments (Hamilton, 2018). Both hardware and social VR platforms rarely integrate assistive technologies such as text-to-speech readers or voice control and do not offer features like audio description. They also limit the comfort of using assistive devices, even those as common as corrective glasses. The insufficient development of hardware and VR platform accessibility can result in the exclusion of individuals with varying degrees of disabilities, which presents a challenge for organizers striving to maximize inclusivity in educational events. It is essential to recognize these barriers and mitigate them to the extent possible.

Limitations of Avatars Participants in *Wirtualium 3.0* could create personalized avatars using the Spatial avatar creator or the synchronized Ready Player Me extension, a cross-platform application for avatar creation in social VR. However, certain limitations of these tools raise our concerns regarding inclusivity. For instance,

> "Users are required to choose whether their avatar is male or female, which can be exclusionary for non-binary individuals." (Jan)

Additionally, these creators do not allow for avatars with visible disabilities or representing older individuals. The exclusion of these groups from virtual events poses a significant risk to their inclusivity.

Avatar-mediated communication can be unfamiliar and challenging for some participants.

> "Individuals who accidentally walk onto the stage may feel uncomfortable knowing their 'mistake' is visible to everyone". (Jan)

> "I'm not very skilled at navigating Spatial. This year, while moderating a presentation, I accidentally walked onto the stage after the speaker had already started. I was worried I might have distracted him and inadvertently interrupted the presentation." (Zosia)

Such situations can potentially hinder the focus on educational content.

Recent studies have explored the impact of avatar visibility on the sense of co-presence in virtual spaces (Freiwald et al., 2021; Heidicker, 2017). From an organizational perspective, however, we recognize an additional, underexplored aspect of this phenomenon. When fewer participants attend a social VR event than expected, the sense of emptiness or lack of presence can be more visible compared to videoconferencing. This might be linked to the feeling of spatial presence

without corresponding social presence and the visibility of unoccupied chairs and empty spaces. Further research is needed to address this gap.

Limited Number of Participants In familiarizing ourselves with the specific features of various social VR platforms, we noted significant limitations regarding the number of individuals who can simultaneously inhabit a single virtual world. On Spatial, a maximum of 50 users can occupy the same virtual space, a common constraint on other social VR platforms as well. Additionally,

> "our experience organizing the *Wirtualium* highlighted that events in social VR must cater to much smaller groups compared to those on videoconferencing platforms. This is not only due to platform limitations but also because organizers must provide more extensive support to participants. We could only accommodate 10 teams (3 persons each) for the planned scientific workshops, as inviting more participants could have jeopardized the workshops if numerous technical issues arose." (Jan)

Limitations of Educational Content In theory, using VR tools and social VR platforms should enrich the educational content. However, our experience has shown that social VR also poses significant risks to the quality of content. Many social VR platforms lack built-in tools for screen sharing, which are common in videoconferencing software. Often, these platforms require speakers to install additional software, complicating the process of sharing content. As a result, some speakers may opt not to share presentations during their talks.

This was one reason why we chose the Spatial platform, which features an intuitive interface for screen sharing. Presentations were displayed as a virtual screen on the auditorium stage. However, this functionality is available only to desktop users, and sharing presentations via HMDs is impossible. VR users must log in simultaneously from a desktop to share a presentation.

> "Some speakers encountered issues with playing multimedia content during their presentations – quality was reduced, and media playback was choppy." (Sylwia)

Studies highlight interactivity as a key advantage of VR in education (Hamilton et al., 2021). Unfortunately, a significant limitation of using interactive solutions in social VR is the restricted ability to integrate external sites and applications (e.g., for quizzes), especially since HMD users would not be able to access them. For example, during the conference, one keynote speaker wanted to conduct a poll, but Spatial lacked that capability. As a workaround, we set up three objects in the auditorium for participants to approach and indicate their choice.

The novelty effect associated with the innovative format of academic events in social VR might initially attract participants but could lead to a scenario where

they focus more on the impressive virtual environments than on the substantive content. We recognize the risk that after the initial excitement, participants might lose interest in the educational material. Most studies on the effectiveness of VR in education utilize short-term interventions (Hamilton et al., 2021), however, we emphasize the need to also conduct longitudinal studies to assess the long-term effectiveness of these tools.

RQ3 & RQ4 | Challenges Faced by the Organizers

The Sense of Responsibility and the Need to 'Defend' the Event's Format

The use of social VR for organizing educational events remains relatively uncommon, a factor that significantly influences the perception and reception of such events.

> "For many, social VR is not fully understood; despite its recognition as a 'modern' approach, some may view it as less scientific or more 'casual' compared to traditional, in-person academic events." (Aleksandra)

Consequently, during the organization of *Wirtualium 3.0*, we experienced additional pressure, both personal (a sense of responsibility for the event's success) and social (the perception of the conference by participants and the broader academic community). Organizing a conference in social VR required us to invest more effort and time to uphold impeccable academic standards, ensuring the event's scholarly rigor despite its unconventional format.

> "I feel a greater responsibility in organizing this conference due to its atypical format, as my team must 'prove' that this mode of organization is a viable choice. This pressure is absent in traditional solutions such as videoconferencing." (Jan)

Digital Competencies and Technological Stress

Preparing educational events in social VR demanded that we acquire the necessary digital competencies. We had to devote considerable time to mastering the use of the Spatial platform to ensure the smooth execution of *Wirtualium 3.0* and to provide technical support for participants. Despite our efforts, recurring issues with platform functionality, microphones, and internet connectivity became a continual source of stress, as was reported to us by the conference participants.

> "These technical difficulties posed significant limitations during the event, fostering feelings of anxiety and frustration over a lack of control or concerns about being perceived as unprofessional. […] I fear the

> possibility of technical issues, such as a presenter being unable to share their presentation." (Aleksandra)

Anxiety and fear related to the use and management of technological tools are often described within the framework of technological stress, or *technostress* – an adverse psychological reaction to the inability to adapt to technology (Tarafdar et al., 2015). In our experience, educational events in social VR may induce greater technological stress than videoconferencing tools, which we have generally become accustomed to.

> "Once this initial barrier is overcome, people tend to recognize the value of social VR events; however, I worry that many choose not to participate due to the technical challenges involved." (Jan)

Consequently,

> "organizing an educational event in social VR necessitates much more consideration of 'what could go wrong' and the preparation of numerous operational instructions." (Aleksandra)

On the one hand, learning to use social VR can be a challenge for participants, but on the other hand, we believe it also offers them valuable practical insights into these platforms. Unfortunately, social VR platforms are frequently updated or closed over the years. This requires participants to relearn their use, and we, as organizers, to prepare updated instructions, as has been the case annually with *Wirtualium*.

Before the conference and workshops, we decided to organize instructional meetings. These sessions allowed us to provide appropriate support tailored to the individual needs of participants, but they also required additional time from both the participants and us. As a result, we were unable to organize such meetings for all conference attendees, focusing instead on the presenters. Additionally, we provided instructions on the project's website.

> "While preparing these instructions, I realized that participants in educational events in social VR have vastly different needs. Some require only a few simple guidelines with links and key steps, preferring concise instructions. Others need a wealth of information, not only on the specific platform but on the entire system, such as how to use the scroll wheel to zoom out or how to navigate using an HMD." (Jan)

Unclear Formal Issues

The innovative nature of events in social VR introduces new formal challenges which we encountered during the organization of *Wirtualium*. Some universities are bound by agreements with specific videoconferencing platforms, often preventing the use of alternative platforms for hosting online events. Within the European Union, GDPR-related issues arise if the servers of social VR platforms, such as Spatial, are located outside its borders. The absence of established templates for regulations and procedures frequently compelled us to consult with legal advisors and data protection officers. The predominance of English-language terms of service across most platforms further complicates their accessibility for legal departments at Polish universities which require certified translations by sworn translators.

Additionally, the matter of obtaining necessary consents from the legal guardians of non-adults participating in educational events in social VR remains unclear. In the case of the Summer VR Academy, the required consents were collected by the school teachers; however, we did not provide standardized content, which may have created challenges for them. The formal challenges associated with using social VR platforms for educational events required extra effort on our part and added to the stress of making responsible decisions. This presents a significant barrier to the implementation of VR solutions in education, a topic that has yet to receive sufficient attention in academic literature.

Time-Consuming

The challenges inherent in the innovative nature of social VR platforms result in the organization of educational events within social VR being a process that demands significantly more effort and attention to detail compared to events utilizing videoconferencing tools.

> "This week, the conference organization increasingly encroached upon my personal life, due in part to the need for preparation (both in terms of equipment and mentally) for panel moderation. While the effort involved can be seen as an opportunity to hone organizational skills, it does not negate the fatigue it entails." (Sylwia)

A Happy Ending

Despite the challenges we faced during the organization of *Wirtualium 3.0*, we received feedback indicating a highly positive reception of this innovative project format. Participants frequently expressed their appreciation for the concept and execution of the event, acknowledging the efforts made to create a space conducive to discussion and networking.

> "Numerous positive accounts of the conference were shared on social media by both participants and the organizations that sponsored the event, as well as the university units involved in its organization." (Sylwia).

Sense of Development

The organization of *Wirtualium 3.0* significantly contributed to the enhancement of our competencies in project coordination and utilization of social VR. This process offered an opportunity for action-based reflection on the application of new technologies in education.

> "I improved my ability to address various technical and logistical issues. Each of these challenges contributed to my growth as an organizer and allowed me to better understand the needs of participants and the specificities of working in virtual educational environments." (Sylwia)

Sense of Social Purpose

We all felt that we were participating in a significant social and academic endeavor, with a strong sense of pioneering in this field. We believe that social VR platforms possess the potential to eliminate certain barriers to knowledge dissemination that are rooted in traditional social and academic hierarchies (e.g., through the use of pseudonyms in communication, regardless of academic titles) as well as physical barriers (e.g., geographical location). Despite the challenges and obstacles associated with utilizing social VR for conducting educational events, we perceive VR as having the potential to foster community building and enhance the engagement of individuals who, for various reasons, cannot participate in physical events. Also, Maloney and Freeman (2020) note that social VR enables meaningful interactions for individuals facing barriers in physical settings

Psychophysical Well-being of Organizers

The organization of the project had a significant impact on our psychophysical well-being. During the intense preparation period, we faced difficulties in balancing organizational tasks with numerous professional and personal responsibilities. These intense preparations were a source of considerable stress, mental fatigue, and anxiety.

> "I felt some anxiety about whether everything would go smoothly, particularly due to issues such as my unreliable internet connection. I was uncertain whether I would be able to assist the expert whose lecture I was moderating if technical issues arose" (Aleksandra)

Moreover, we experienced physical discomfort from a prolonged use of HMDs and desktop setups, such as eye strain, neck pain, and fatigue.

Sense of Support

Mutual support within the organizing group significantly impacted our work efficiency and sense of safety. A fundamental aspect of team support was effective communication, especially in crisis situations. Support and good organization are particularly important in an academic context, where individuals often struggle with an overload of responsibilities and difficulties in maintaining a work-life balance. This is especially crucial given the substantial demands associated with organizing educational events in social VR, which may be significantly more challenging to master due to their non-standard, novel character.

Development of Academic Identity

Involvement in the organization of *Wirtualium 3.0* had a positive impact on our academic identity and reputation. It allowed us to voice our perspectives in university media and establish new relationships with representatives of various academic institutions, which could foster the development of our academic careers. Although some individuals not involved with VR technology may not fully understand this form of event organization, its innovative nature and the help organizers craft an image as advanced and competent experts in new technologies. However, it is crucial to emphasize that this image must be grounded in genuinely possessed competencies.

Conclusions & Recommendations

Our autoethnographic study enabled a critical examination of the challenges educators encounter when utilizing VR technology to organize educational events. In this research, we identified significant limitations in the educational use of social VR platforms, aspects that remain underexplored in the existing literature. These limitations primarily involve the limited accessibility and comfort of HMD devices, the potential risk of reducing inclusivity of these events, and concerns regarding the quality of educational content. Our study emphasizes that the processes involved in implementing innovative VR technologies in education may lead to increased workload, a heightened sense of responsibility, and technological stress, which could negatively impact the well-being of organizers. However, organizing such events in social VR can also provide educators with a sense of personal growth and purpose. To address the challenges related to implementing social VR for

organizing educational events and to reduce the negative experiences of organizers, we present the following recommendations (RQ5 & RQ2):

1. *Utilizing Platforms that Support Both VR and Non-VR Devices.* Given the discomfort associated with prolonged HMD use and the limited accessibility and inclusivity of this technology, we recommend selecting social VR platforms for educational events that also allow connections from desktop and/or mobile devices (e.g., Spatial, Rec Room).
2. *Preparing Platform Usage Instructions.* We recommend providing instructions tailored to different levels of users' digital competencies and organizing instructional meetings to enhance comfort and reduce barriers to participation and providing a Code of Conduct to ensure appropriate behavior of participants. Preparing contingency plans and operational instructions for organizers/moderators in case of unforeseen issues is also advisable.
3. *Informing Participants of Event Barriers.* We suggest informing participants about potential barriers related to using social VR (e.g., hardware requirements, internet speed) so they can adequately prepare.
4. *Organizing Events for Smaller Groups.* When planning events, it is important to consider the user limits imposed by the chosen social VR platform (e.g., 50 users in Spatial).
5. *Enhancing the Scientific Image of Social VR Events.* We recommend maintaining a balance in media communication about the event between its educational and innovative nature.
6. *Mutual Support.* Ensuring internal team support is crucial for the effective organization of educational events in social VR, which involves increased effort and stress.
7. *Expanding the Team.* For events planned for larger audiences, we suggest engaging additional personnel to provide adequate technical support and reduce the stress associated with overburdening individual organizers.
8. *Integrating the Social VR Event Organizer Community.* Given the heavy workload of organizers, the need to expand teams, and for problem-solving support, we emphasize the importance of developing a community of social VR event organizers. To this end, we invite interested individuals to join our Discord server https://discord.gg/jeKmT4BM.

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Dźwiganie ciężaru innowacji w edukacji – stawanie się organizatorami wydarzeń edukacyjnych w społecznościowej wirtualnej rzeczywistości

S t r e s z c z e n i e

Najnowsze badania laboratoryjne coraz częściej eksplorują zastosowanie technologii wirtualnej rzeczywistości (VR) w edukacji. Chociaż badania te potwierdzają potencjał narzędzi VR, często pomijają wyzwania, z jakimi mierzą się edukatorzy podczas ich wdrażania w rzeczywistych warunkach, co może ograniczać szersze zastosowanie VR. Nasze badanie wykorzystuje kolaboratywną analityczną autoetnografię pięciu organizatorów(-ek) wydarzeń edukacyjnych w społecznościowej VR, aby wypełnić tę lukę. Zidentyfikowaliśmy ograniczenia związane z wykorzystaniem społecznościowej VR, takie jak dyskomfort i niska dostępność urządzeń VR, nieinkluzywność funkcji platform, ryzyko obniżenia jakości treści edukacyjnych oraz konieczność zdobycia nowych umiejętności cyfrowych. Organizatorzy(-rki) doświadczali znacznej odpowiedzialności i stresu związanego z zarządzaniem kwestiami technicznymi i formalnymi, co wpływało na ich samopoczucie i zwiększało obciążenie pracą. Niemniej jednak zgłaszali również silne poczucie celowości i osobistego rozwoju, które wzmacniało ich tożsamość akademicką. Pomimo wyzwań związanych z organizacją wydarzeń w tym immersyjnym środowisku, organizatorzy(-rki) raportowali poczucie znaczącego rozwoju zawodowego. Ich zaangażowanie nie tylko zwiększyło ich umiejętności, ale także sprzyjało nawiązywaniu cennych współprac między instytucjami akademickimi, budowaniu społeczności oraz promowało inkluzywną edukację. Aby przezwyciężyć ograniczenia społecznej VR w szkolnictwie wyższym i złagodzić negatywne skutki dla organizatorów(-ek), autorzy(-rki) przedstawiają rekomendacje dla edukatorów(-ek).

S ł o w a k l u c z o w e: innowacje; autoetnografia; społecznościowa VR; rzeczywistość wirtualna; edukacja

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Cargando con el peso de la innovación en la educación: Convertirse en organizadores de eventos educativos en la realidad virtual social

Resumen

Recientes investigaciones en el laboratorio exploran cada vez más el uso de la tecnología de realidad virtual (VR) en la educación. Si bien estos estudios confirman el potencial de las herramientas de VR, a menudo pasan por alto los desafíos que enfrentan los educadores en la implementación en el mundo real, lo que podría dificultar la adopción más amplia de la VR. Nuestro estudio emplea una autoetnografía colaborativa y analítica de cinco organizadores de eventos educativos en VR social para abordar esta brecha. Identificamos limitaciones en el uso de la VR social relacionadas con el malestar y la baja accesibilidad de los cascos las gafas de realidad virtual, la falta de inclusividad de las plataformas, el riesgo de reducción en la calidad del contenido educativo y la necesidad de adquirir nuevas habilidades digitales. Los organizadores experimentaron una responsabilidad significativa y estrés al gestionar cuestiones técnicas y formales, lo que afectó su bienestar e incrementó su carga de trabajo. Sin embargo, también reportaron un fuerte sentido de propósito y desarrollo personal, que reforzó su identidad académica. A pesar de los desafíos de organizar eventos en este entorno inmersivo, los participantes experimentaron un crecimiento profesional significativo. Su participación no solo mejoró sus habilidades, sino que también fomentó valiosas colaboraciones entre instituciones académicas, fortaleció la comunidad y promovió la inclusión en la educación. Para abordar las limitaciones de la VR social en la educación superior y mitigar los impactos negativos en los organizadores, los autores ofrecen recomendaciones para los educadores.

Palabras clave: innovación; autoetnografía; VR social; realidad virtual; educación

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Ношение бремени инноваций в образовании: Становление организаторами образовательных событий в социальной виртуальной реальности

Аннотация

Недавние лабораторные исследования всё чаще изучают использование технологий виртуальной реальности (VR) в образовании. Хотя эти исследования подтверждают потенциал инструментов VR, они часто упускают из виду трудности, с которыми сталкиваются преподаватели при их внедрении в реальных условиях, что может препятствовать более широкому применению VR. Наше исследование использует коллаборативную и аналитическую автоэтнографию пяти организаторов образовательных мероприятий в социальной виртуальной реальности для устранения этого пробела. Мы выявили ограничения использования социальной VR, связанные с дискомфортом и низкой доступностью гарнитур, недостаточной инклюзивностью функций платформ, риском снижения качества образовательного контента и необходимостью освоения новых цифровых навыков. Организаторы столкнулись с высокой степенью ответственности и стрессом из-за необходимости управления техническими и формальными вопросами, что повлияло на их благополучие и увеличило рабочую нагрузку. Тем не менее, они также отмети-

ли сильное чувство цели и личного развития, что укрепило их академическую идентичность. Несмотря на сложности организации мероприятий в этой иммерсивной среде, участники испытали значительный профессиональный рост. Их участие не только улучшило их навыки, но также способствовало развитию ценных сотрудничеств между академическими учреждениями, укреплению сообщества и продвижению инклюзивности в образовании. Чтобы устранить ограничения социальной VR в высшем образовании и смягчить негативное воздействие на организаторов, авторы предоставляют рекомендации для педагогов.

К л ю ч е в ы е с л о в а: инновации; автоэтнография; социальная VR; виртуальная реальность; образование