Experiments on Creation of Virtual Fields for Mutual Interaction: Remote studio courses on Colombo, Sri Lanka, and Kawagoe, Japan

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1. Area Studies, Architecture and Their Fieldworks

Since 2009, I have been conducting fieldwork in the South Asian and Indian Ocean worlds. Having conducted fieldwork as an architectural specialist until 2009, the fundamental question of my research has been how a consistent process from fieldwork to architectural design is possible. Around 2000, it was pointed out that there is a difference between the nature of the research activities to understand the area and the design activities but no solution has been found to solve this gap. From the standpoint that design is about creating novelty, some even argued that in extreme cases, activities to understand the area did not contribute to design.

One of the goals of architecture is to realize a living environment that supports human life through physical and artificial interventions. I myself had the hypothesis that if I could construct a model of the area which explains the physical composition of the area and its transition based on people and their activities, the model would enable architecture to design in conjunction with the area at a level that could not be realized before, and that the area model would be an effective and basic tool for practicing architectural design. The study of urban tissue which had been created during the 1960s was a pioneering research method aiming at similar goals and it has been established as a basic method. An urban tissue is a group of buildings and the streets they face. urban tissues show distinctive patterns in each area. An urban tissue is a physical composition that supports human activities in daily life, and at the same time, it is a physical composition that is constructed, modified, and formed through human activities. Therefore, urban tissues have become the object of many studies as a mirror of daily life, and their compositional principles have been deciphered.

While paying respect to the research of urban tissues, it does not deal with people and their lives which are the starting points of architecture. It has been about half a century since the research of urban organizations was created, but it has not been seriously reviewed till now, which I identified as a problem. In cases where people are treated, people are regarded as an average and abstract existence. It is different from a concrete human being who acts in the context of a series of lives. The author thought that the problem preventing consistency from fieldwork to architectural design is not the difference between the research activities to understand the area and the design activities, but the fact that the image of concrete people and their lives, which should be the starting point of architecture, are entirely left blank, and that this problem will be solved if the image of concrete people and their lives are clarified. The image of concrete people and their lives is rather directly related to the architectural design concept.

I desired to capture people and their lives in everyday life and it was the background of my shift from architecture to area studies. Architectural fieldwork, such as the research of urban tissues, sets the spatial scope of the research, among other things, and elucidates the change of physical composition over time within that range. A specific pattern of the change of physical composition over time can be found in

a specific period. The period found here is set as the time range of the research. In the fieldwork of architecture, there is a tendency to treat the research object and the research method as an established one. The spatial scope set as a field tends to be treated as a given one. In the research of the urban tissue, the urban block has been established as the basic spatial scope set as the field. In contrast, in the fieldwork of area studies, the initial field is the entry point for approaching the object, and several fields are set and explored with varying scope and focus until the entire range of the object to be solved is covered and a solution to the object is obtained. Whereas architectural fieldwork deals with the finite and stylized scope in which solutions can be expected, fieldwork in area studies can be said to be a design problem with no scope restrictions in advance.

A field is an interface for an observer to interact with the real world by setting an object and its scope to be handled by the observer in the real world, reducing the components of the real world and unpredictability and fluidity. Judgment as to whether the scope is appropriate is based on whether or not the scope is effective in capturing the target object. Since the target of the observation of the urban tissue is the change of the physical composition of the building and the street over time, the urban block is appropriate for the scope of observation. On the other hand, observations of urban tissues cannot target people and their lives, which should be the starting point of architecture. In fieldwork for people and their lives, it is necessary to set the corresponding scope of observation.

In area studies, I have studied the dynamics of the specific area in the historical area of Colombo (Sri Lanka), which is generally recognized as informal settlements, through interaction between people and physical compositions in daily life. During this time, it was a valuable experience to explore a method of describing events based on the actor-network theory, which treats the world

as a heterogeneous network which consists of people, things, and words, and a method of setting a suitable scope for the field at the Graduate School of Asian and African Area Studies, Center for Integrated Area Studies and Center for Southeast Asian Area Studies, Kyoto University. The spatial scope of the field was not set in advance, and the route of the movement of the dweller in the life was traced. While tracing the route of the movement of dwellers, I went back and forth between the Colombo city, various parts of South India, Dubai (UAE), Singapore, various parts of Malaysia, Bangkok, Yangon, Mandalay, Hong Kong, and various parts of Japan, and caught the networks of discrete living environments constituting their daily lives. And, by setting several different spatial scopes such as Colombo city, Ceylon Island, and Indian ocean, and time scopes and by capturing and combining the dynamics of the target area and its inhabitants which is related to the dynamics of a wide space-time, a dynamic model of the area has been drawn. (YAMADA (2012, 2013, and 2016)).

2. An Experiment on Design-Oriented Virtual Fieldwork 1: Rehabilitation Design of Colombo Historical Area Studio Course in Japan

Since moving to design studies in 2018, as a practice to verify the hypothesis that a model of the area starting from concrete dwellers and their lives enable the designs linked to the area in architecture, a studio course for undergraduate students have been conducted on the issue of designing local facilities that realize rehabilitation of the historical area of Colombo (Sri Lanka), which has been my field since 2004 (Fig. 1, 2). Students who have taken the studio course have never actually visited the historical area of Colombo. I provided a dynamic model of the area through the interaction between human

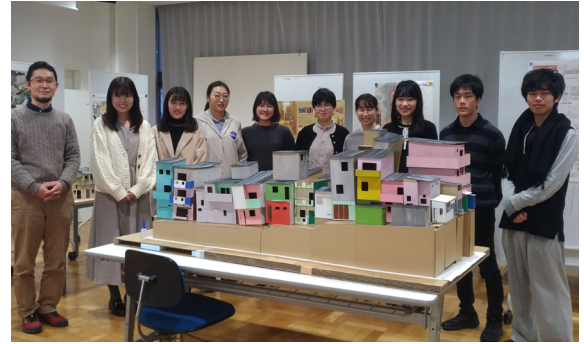Figure 1   The Selected Residential Area of Colombo Historical Area

Figure 2   The Studio Course on Colombo Historical Area
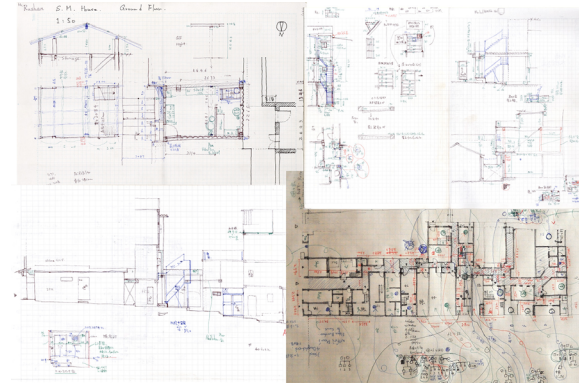

Figure 3   Photographs of the Site

Figure 4   Plans and Cross-sections of Buildings of the Site

activities and the physical composition, which was constructed through the fieldwork done so far, and accumulated photographs, videos, and plans and cross-sections of the buildings of the site (Fig. 3, 4). In addition, special lecturers from Sri Lanka and other countries were invited to give an international lecture to deepen the understanding of the target area (Fig. 5).

The dynamic model of the area is based on the knowledge and materials obtained from the research, and it is a reconstruction of the mechanism by which the physical composition of the region is born, starting from concrete dwellers and their lives. The observer's understanding of the area was strongly reflected, but it was based on the viewpoint as one of the residents and it is an interface in which designers gain a secondary understanding of the elements that make the daily life, including the actions, intentions, and meanings of the dweller, and the systems consisting of those elements. Based on that understanding, it is an interface which allows designers to explore new ways of engaging between people and the area and the architecture that supports them. Special

lectures have the same effect. It is a material to overcome the restriction of not being able to meet people who live in the area in person. The photographs, videos, and plans and cross-sections of buildings of the site are a concrete record of the physical configuration of the subject site and how it appears and they are less influenced by the viewpoint of the observer who conducted the fieldwork. In order to understand the photographs, videos, and plans and cross-sections of the buildings of the site, the attitude to explore them actively and connect them to each other was necessary. As a result, these materials allow designers to reconstruct the physical composition of the target area three-dimensionally and to read

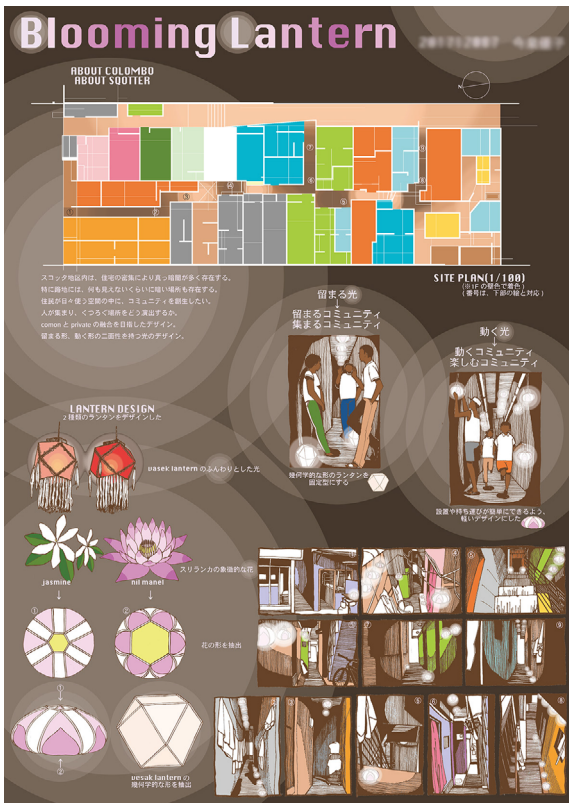Figure 5   A Special Lecture of Professor Mohan Pant

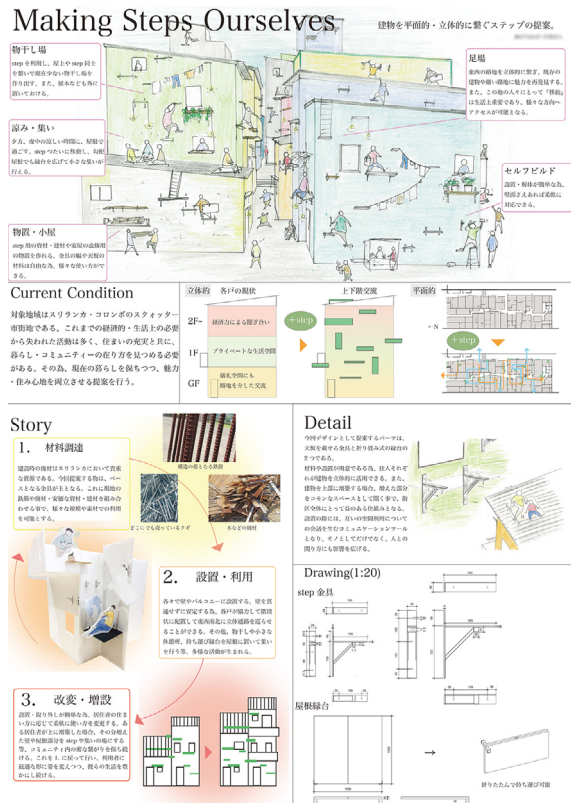Figure 6　Student Design Proposal No. 01

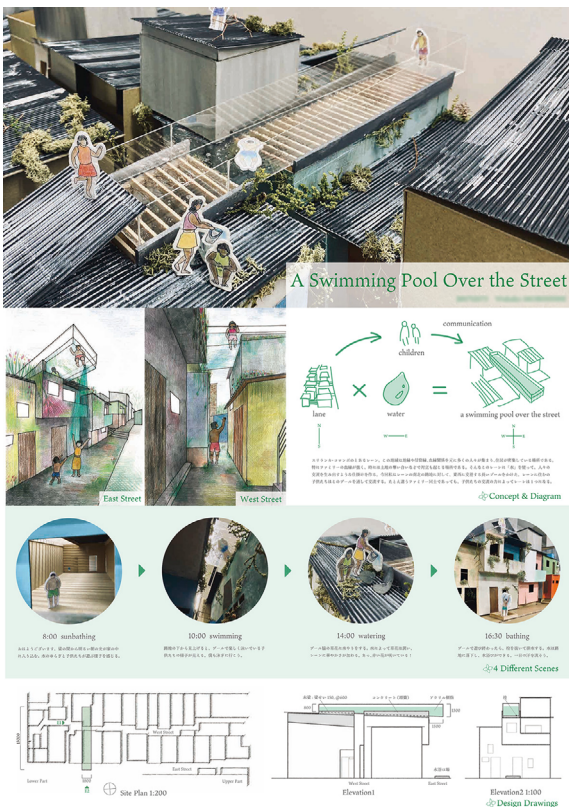

Figure 7　Student Design Proposal No. 02

Figure 8　Student Design Proposal No. 03

Figure 9　Student Design Proposal No. 04

the target area from their own points of view.

The students who participated in the studio course were enthusiastic about the experience of getting to know the region deeply and feeling close to it by gaining an understanding of specific dwellers and their lives from the dynamic model of the area and special lectures and then connecting their findings with the various discoveries made by them by exploring photographs, videos, and plans and cross-sections of the buildings of the site. While the question remains as to how much students could have got out from the perspective of the observer, who actually conducted the fieldwork, and constructed their own perspectives, students were able to conduct secondary fieldwork, so to speak, by combining a dynamic model of the

area with photographs, videos, and plans and cross-sections of the buildings of the site.

The design proposals made by the students were based on their own understandings of dwellers' lives and physical features of the area, and were attractive and close to the local community (Fig. 6, 7, 8, 9). Additionally, an attachment to the area and a desire to visit the site was created among the students. When the students' design proposals were introduced to a local acquaintance via online, he was surprised at students' understandings on the lifestyles of the local dwellers and commented that he was moved by the wonderful proposals. From there, the local dwellers and I have been working together to hold an exhibition by displaying models and panels of the works in the target area. The exhibition was planned to be held in August 2020 but had to be postponed due to covid-19, which prevented gaining the necessary permission from the Sri Lankan Police.

3. Extending Design-oriented Virtual Fieldwork

The global infection of COVID-19 from 2020 has created great difficulty in area studies. I myself could not go to the field of Colombo, so I was only able to contact the local acquaintances online. Under these circumstances, I thought that some people, who are interested in fieldwork in Japan, might be in trouble because they could not come to their fields where I am currently living. Therefore, I thought that there might be a way of area studies to build a mechanism and contents that can virtually perform fieldwork in my area and share it with people in remote areas.

I began exploring in 2020 how to develop and extend the method of virtual fieldwork I experimented at the studio course for the Historical Area of Colombo, which modeled remote areas and brought them to his own region, to create a dynamic model of my own area and

deliver it to a remote place. Since 2020, during the COVID-19 disaster period, my lab has been experimenting with virtual fieldwork methods that connect fields and observers with online videos, as described in the Chapters 1 and 5. With online virtual fieldwork, though, observers cannot go directly to the site, they can explore in response to the field and in real time to obtain primary data of the field. Observers can also interact with specific local people.

Therefore, a more comprehensive design-oriented virtual fieldwork system was conceived to develop the virtual field experience and the ability of exploration by combining the online virtual fieldwork method with a secondary virtual fieldwork method consisting of a dynamic model of the area and data of physical environment of the area, which was validated in the studio course for the Historical Area of Colombo. The data set for the secondary virtual fieldwork was renamed as "The Offline Virtual Field Kit" in contrast to the Online Virtual Fieldwork. Finally, in addition to 1. an offline virtual field kit and 2. online virtual fieldwork, 3. online meetings (Zoom, Slack, and etc.) as a place to discuss and practice design issues was added and the system of the studio course based on virtual fieldwork was composed as "Tsukuba Virtual Fieldwork Studio Course Package" (Fig. 10). The Tsukuba Virtual Fieldwork Studio Course Package was applied to the international joint design workshop held from January to February 2022, targeting Kawagoe, one of the most significant historical cities in the Kanto region, with the theme of regenerating the Saraswati By-street (弁天横丁).

4. An Experiment on Design-Oriented Virtual Fieldwork 2: Tsukuba Virtual Fieldwork Studio Course Package at Kawagoe Saraswati By-streeet

Figure. 11 is an outline and a schedule of the

workshop. 60 students, 11 faculty members and TAs from the University of Tsukuba, the Université Grenoble Alpes (France) and the Politecnico di Milano (Italy) participated this workshop. Figure 12 shows the data set which consists the offline virtual field kit. Whereas the studio course for the Colombo Historical Area used a dynamic model of the area and photographs, videos and plans and cross-sections of the buildings of the site as reference materials, this workshop used the 360 ° videos which convey the scenery when a person walks on the spot and the 3D laser scanned spatial data which convey the physical composition of the street space instead of photographs, videos and plans and cross-sections of the buildings of the site. For the collection of the materials in the historical area of Colombo, it took more than 10 years, but by simplifying the materials, the collection of materials in Saraswasti By-street, Kawagoe was completed within one and a half years.

In the online virtual fieldwork, the design of an interactive real-time broadcasting system was mainly carried out by Professor Toshimasa YAMANAKA of the Degree Program in Design to which I belong and Rakuten Mobile, Inc., which is conducting special joint research projects with Professor YAMANAKA. At the site, the video was moved while shooting with Richo θ 360 ° cameras

and the video was distributed with Richo's online conference system. Students in remote areas were able to observe the 360 ° landscape in real time by participating in the online conference. The observer was able to operate the video landscape displayed on the screen of a personal computer or a smartphone with his / her finger to see the landscape in the desired direction independently of the moving direction of the camera. In addition, a system was prepared in which the position of the 360 ° camera was displayed on a map of the site via GPS (Fig. 13, 14). Multiple 360 ° cameras were set for the distribution using the online conference system, and each 360 ° camera moved on a different route centered on Saraswati By-street. The settings of spatial-temporal scope, observation targets (buildings, streets, bird's-eye view of the landscape), components (inviting local people to participate, etc.) and observational route of the field were designed by me to keep the link with the offline virtual field kit. At the same time, distribution of a simpler interactive broadcasting system via a Zoom video with a smartphone fixed to a gimbal was performed.

When a feedback survey with questionnaire was done with the participants from the Université Grenoble Alpes and the Politecnico di Milano about their experience in participating in the online virtual fieldwork, they expressed that they were

Figure 10   Tsukuba Virtual Fieldwork Studio Course Package

Renovation of a Historical City from the Perspective of Ecosystems - Kawagoe Saraswati Bystreet 川越弁天横丁 -

Figure 11   The Outline and Schedule of International Joint Design Workshop in Kawagoe

surprised and excited by the fresh experience and gave great feedback (Fig. 15). In particular, the 360 ° videos that can be operated by oneself were highly evaluated. The system that displays the position of the 360 ° cameras on the map received the second highest evaluation. With that, the effectiveness of the system that helps to identify one's observation position without getting lost, even in a foreign land, to which the observer has never visited was confirmed. At the same time, although it was a simple system, the zoom broadcasting video was also highly evaluated up to the same level of the 360° videos, as that allowed the observers to enter the houses or stores and interview some specific dwellers and hear the stories from them.
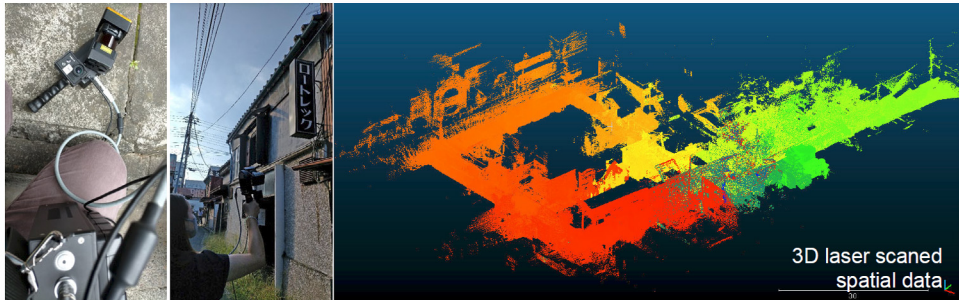
From the viewpoint of the fieldwork, one of the evaluation points was how close to the field an observer can conduct independent observations, establish his / her own original hypothesis related to the dynamics of the area, and verify his / her own hypothesis through observations in a form closer to the field. From this point of view, the

A Packages to Communicate and Share the Knowledge of the Field
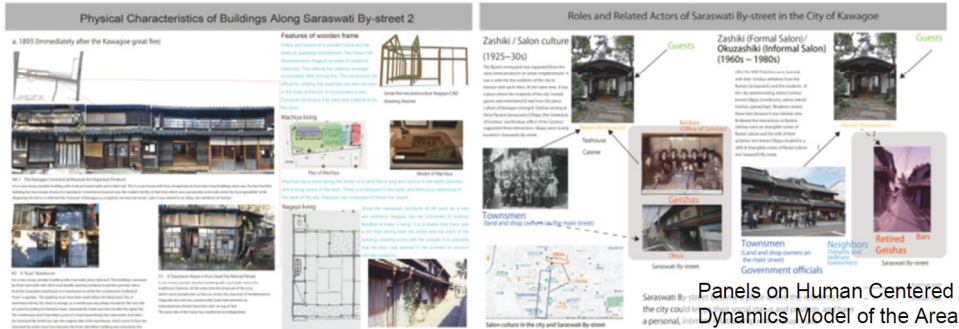
Offline Virtual Field Kit

Figure 12   Data Set of Offline Virtual Field Kit
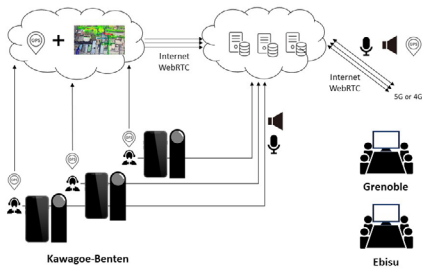
Figure 13   360 Interactive Broadcasting System supported by Rakuten Mobile, Inc.

Figure 14   The interface of the 360 Interactive Broadcasting System

following two devices were particularly effective. The first was the 360° camera and the conference system. With a 360 ° camera and a conference

Figure 15   A Scene at Université Grenoble Alpes During the Workshop

system, observers were able to move around a wide area with the camera and simultaneously operate each screen to see the direction they want to see. This gave them room to hypothesize and explore for verification by themselves, at a distance from the viewpoint provided by the guide, unlike a fixed tour, which follows the guide. The second was the participation of Saraswati By-street residents, store managers, and NGO officials as members of the field (Fig. 16, 17). When the video was broadcasted, explanations were given about Saraswati By-street's buildings and activities from the local point of view, and a chance for direct

Figure 16   An Explanation of the Area by a Local Expert During the Virtual Fieldwork

Figure 17   An Interview with a Local Shop Owner

interviews with specific dwellers to listen to the stories of those involved and to ask questions was offered. That was an opportunity to understand Saraswati By-street from the local context.

In this case, online virtual fieldwork was conducted only for 90 minutes. Since it takes time for participants to proactively observe the field from their own perspective, and it is necessary to ask questions in interviews, it would have been more effective if the organizers were able to conduct the online virtual fieldwork for a longer time period, such as for a half a day. On the other hand, in the online virtual fieldwork, since the number of people who actually visit the target area does not physically increase, it was confirmed that even if a large number of people participated, it was possible to implement it without destroying the original calm street atmosphere. On the other hand, to acquire a deep understanding of the dwellers, their lifestyles, and physical composition of the target area, deep reading of a dynamic model of the area, lectures, and discussions are necessary, and there is also an upper limit required for the number of participants from such a viewpoint. While continuing to improve the structure of Tsukuba Virtual Fieldwork Course Package with the aim of supporting independent and deep explorations, the author would like to share virtual fields with remote collaborators and explore the ideal way of architectural design based on the fieldwork.

The resulting works of the International

Collaborative Design Workshop were presented at the International Creativity Studies Festival, organized by the Degree Program in Design, on February 18 and 19 2022. There were 138 participants from six countries in two days. Figures 18-20 are the resulting works and their presentation scenes.

5.   Further Considerations

At the symposium "Area Studies in Corona Disaster" held by CIRAS Center, Center for Southeast Asian Area Studies, Kyoto University
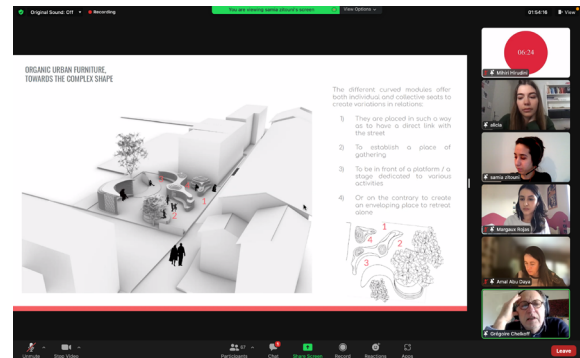

Figure18   A Presentation of the Resulting Work of the Workshop by Université Grenoble Alpes at International Creativity Studies Festival
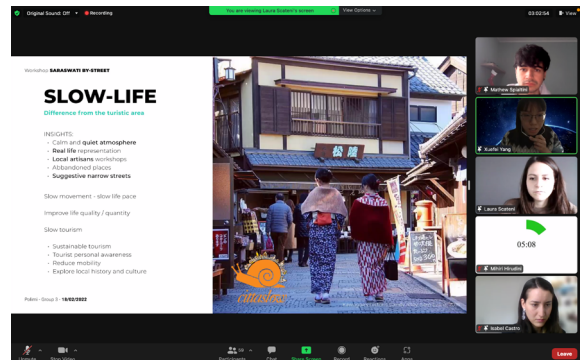

Figure19   A Presentation of the Resulting Work of the Workshop by Politecnico di Molano at International Creativity Studies Festival

Figure 20   A Presentation of the Resulting Work of the Workshop by University of Tsukuba at International Creativity Studies Festival

in February 16 2021, it was pointed out that the difficulties that arise in area studies due to the inability to visit the actual field are not limited to the restrictions on field research, but also to the difficulties which arise while building mutual trust with the strangers through the non-face-to-face communication methods.

When I carried out the studio course based on the Tsukuba Virtual Fieldwork Studio Course Package, I had one hypothesis and an expectation that the virtual field, which was seriously constructed by a researcher of area study, induces enthusiasm to its explorers, or participants, and at the same time brings deep local experience, great discoveries in the area and the excitement that accompanies them. This excitement would stimulate participants' desire to converse and through the conversation, shared experiences would be formed, which lead to the creation of mutual trust even via online.

It is natural that the author learned from the implementation, but what is more important in the workshop was the experience as a whole and it should be noted that the contents, communication methods and the moderation process during the workshop were also not that simple. After the workshop, four graduate students from the Université Grenoble Alpes continued their master's research at Sarasawti By-street, Kawagoe. I will continue to examine the pros and cons of how much the experience of Virtual Field has created a shared experience among unfamiliar people and has developed a relationship of trust through the interviews with the participants.

Finally, this paper looks back on how the observers (workshop participants) interacted with local stakeholders. I tried to share the situation as much as possible by sharing survey data with local dwellers, store managers, and NGO personnel and inviting them to international presentations of resulting works. In addition, I am planning to hold a presentation of resulting works of the workshop at the site and the feedback perspectives and design proposals will contribute to the regeneration of Saraswati By-street. On the other hand, during the virtual fieldwork, I attempted mutual communication between the observers and local stakeholders through interviews, but since the local shopkeepers and NGO personnel could not see the observers, there were no opportunities for the local stakeholders to ask questions from the observers. The future challenge is to develop a system to support mutual communications, through methods such as setting up monitors at the site to project the image of the observers and preparing and sharing self-introduction materials in advance.

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