

# Post-Pandemic Spatial Decisions with University Students' Awareness of Covid-19 Measures in The Built Environment

Tuğçe Pekdoğan<sup>1\*</sup>, Mina Aslan<sup>2</sup>

**Abstract:** Coronavirus, also called COVID-19 by the World Health Organization (WHO), was announced worldwide as a respiratory disease on 11 February 2020. In Türkiye, the first COVID-19 case was seen on 11 March. However, it is assumed that the world has not yet recovered from its effects and will not recover for many years. Pandemic coordination boards, science boards, and operation centers were established worldwide to prevent the pandemic's spread. These centers have published guidelines, posters, and brochures for public transportation places such as COVID-19 Risk Assessment, COVID-19 Guide, hospitals, workplaces, and public transportation to inform the communities. Measures to cover the whole society, especially in closed areas, have been implemented to a large extent. In this study, by examining the guide titled "Strategies from the WELL Building Standard to support the fight against COVID-19" published by the International WELL Building Institute (IWBI), thematically, the awareness by the students against COVID-19 was evaluated through the WELL criteria, and the need to be developed in the post-pandemic period. In this study, it is stated that the measures taken to reduce the impact of the pandemic on university students, the WELL criteria set is important for the built environment while conducting awareness research about the measures with the questionnaires made to the students, and also contributes to developing project ideas for designers, architects, and engineers against pandemics encountered worldwide. It is a preliminary study for spatial decisions.

**Keywords:** WELL certification, health, and well-being, COVID-19, spatial precautions.

<sup>1</sup>**Address:** Adana Alparslan Türkeş Science and Technology University Department of Architecture Adana/Türkiye

<sup>2</sup>**Address:** İzmir Katip Çelebi University Department of Architecture İzmir/Türkiye

**\*Corresponding author:** tpekdogan@atu.edu.tr

**Citation:** Pekdoğan, T., Aslan, M. (2023). Post-Pandemic Spatial Decisions with University Students' Awareness of Covid-19 Measures in The Built Environment. Bilge International Journal of Science and Technology Research, 7(1): 78-84.

## 1. INTRODUCTION

Today, while the life quality of cities is rated, it consists of components for the quality of the physical, social, and economic environments. Physical environment quality is the presence of open and green areas, transportation network, transportation type, public transportation, infrastructure, and municipal services, communication, socio-cultural activities, protection of natural and historical values, planning of housing and living environment, housing type and quality, working environment (Kalaycı Önaç and Birişçi 2019). It can be defined by features such as reducing the environmental impact of areas and the presence of recreation areas (Emür and Onsekiz 2007). In this context, the limits of the conceptual framework are determined by today's living conditions and technology.

Today, this framework has surrounded almost every area of our lives with its different variations.

Coronavirus, also called COVID-19 by the World Health Organization (WHO), was announced as a respiratory disease worldwide on 11 February 2020, and the first Covid-19 case in Türkiye was seen on 11 March. Pandemic coordination boards, scientific boards, and operation centers have been established worldwide to prevent the pandemic's spread. These centers have published guides, posters, and brochures for many publishers. However, it is assumed that the world has not yet recovered from its effects and will not recover for many years, even though it has been almost two years since the onset of the pandemic. With the COVID-19 epidemic, negative effects have occurred on public health, the economy, and social and cultural activities. In addition, environmental effects such

as indoor air quality problems and school energy consumption have been observed due to the pandemic (Pekdogan, 2022). The epidemic severely affected public buildings, especially inadequate educational buildings.

With the continuation of online education, disruptions have also occurred due to the lack of technological infrastructure. Compared to face-to-face education, the efficiency obtained has created great debates in the education community and has been the research subject. (Şahin 2021) examined university students' views on online education during the Covid-19 Pandemic (Casacchia et al. 2021). 47% of the participants stated they had problems accessing the distance education system, and 38% did homework and stated that using projects and presentations is not beneficial. In addition, 30% of the participants declared that they had communication problems with the instructors throughout the process.

In Türkiye, a circular was published by the Ministry of Health on 3 March 2022, and a guide was prepared on the precautions to be taken by deciding to end the break in education. With the slowing effect of the COVID-19 pandemic and the spread of vaccination, the measures taken have ceased to be social and have turned into individual restrictions and measures. Along with these rules, the education, carried out online for almost two years, was decided to be fully face-to-face education again in the 2021-22 academic year.

Beginning the emergence of the COVID-19 pandemic, a new awareness has emerged about the precautions to be taken in the built environment to protect people from the virus. For example, buildings with good ventilation and air filtration are becoming more desirable than those without. That's why increasing awareness of the measures taken to protect against COVID-19 in the built environment is important. These measures include increased cleaning and sanitation, as well as social distancing. Following these simple guidelines can help keep ourselves and others safe as we return to our daily lives.

In this study, the conditions of learning and living spaces during the coronavirus pandemic and students' behavior in these spaces are examined within the scope of WELL. In this context, the findings regarding the conditions of learning and living spaces and students' behaviors are discussed by analyzing the questionnaires made by the students. The questionnaire based on the WELL criteria set is applied to 100 students, and further information is collected as additional criteria are created to prevent the COVID-19 pandemic in architectural spaces. Moreover, students were surveyed qualitatively to determine whether they had a general knowledge of the criteria influencing awareness of COVID-19. In this case, the study is based on analyzing physical documents and websites for all WELL Criteria.

IWBI guide (2020) in the WELL COVID-19 Standard section highlights that more work is needed to prevent infection and raise awareness by changing how people behave when using the space. Accordingly, this study aims to contribute to WELL criteria for architectural design,

which is accepted as a support material for adaptation to COVID-19 conditions. Also, IWBI is a member of the United Nations Global Compact, the world's largest corporate citizenship initiative, and works with companies to help them achieve the United Nations Sustainable Development Goals (SDGs) by implementing WELL (International WELL Building Institute, 2018).

University students' use of space and awareness of COVID-19, as well as the problems and solutions, are a suggestion against pandemics that may be encountered in the future. It will contribute to developing project ideas for future architects and raise awareness against pandemics such as COVID-19.

## 2. STRATEGIES FROM THE WELL-BUILDING STRATEGIES AGAINST COVID-19

The research was carried out using the qualitative content analysis method. The WELL guide evaluates spaces in 5 main categories: 1) Air and Ventilation, 2) Water, 3) Nutrition, 4) Light, and 5) Fitness. These recommendations are based on the criteria of air quality, water quality, food quality, light quality, vitality, comfort, and mental qualities defined in the WELL standard. Supporting design interventions and nutrition policies for all, WELL certification is a holistic rating system that places general public health and well-being at the center of decision-making, with a focus on nutrition and fitness as well as the construction and operation of spaces built to improve health (Mikic, 2019).

The guideline proposed by the IWBI aims to ensure that buildings and facilities are designed in a healthy way for their occupants, as well as to guide the healthy use of these buildings in pandemic situations (Labartino 2018). In line with this purpose, the following conditions were also noted in this study: increasing security awareness, providing appropriate ventilation, and operating hygiene and filtration systems effectively and efficiently. The headings used in the analyses are figured out in detail in Table 1.

## 3. MATERIALS AND METHODS

### 3.1. Data collection

This study investigates university students' awareness through the criteria prepared by the WELL building standard to reduce the effects of COVID-19 on both the university and the environment they live in. It researches the measures taken in the educational environments of the participants who are adapting or trying to adapt to the new normal in quarantine through WELL building standards. The measures included in the data collection tool were made under the headings determined by the certification system.

The data set was applied to 100 participants that are university students from different cities and departments selected. The sample group was generally selected from students of architecture and civil engineering, and in addition to having knowledge about the space and the built environment, the surveyed students consisted of second and

third-year students who studied online for about one and a half years at the university with the pandemic that started in 2020.

In this study, survey questions prepared based on the WELL Building Standard Strategies to support the fight against COVID-19 criteria set were asked to determine (1) the awareness levels of university students on the precautions taken for COVID-19 and (2) the spatial decisions that should be taken during the post-pandemic period. The survey questions were applied to 100 university students from different cities and departments in Türkiye to collect the research data. The data obtained from the questionnaires were applied to the study's sample group and were coded over the questionnaire results via SPSS statistical program. Finally, the correlations between the variables were examined.

**3.2. Data analysis**

The purpose of the data analysis in the study is to conduct awareness research on the measures taken and the measures put into practice to cope with the COVID-19 epidemic and reduce the effects on university students. As a result, all questionnaires were analyzed using descriptive statistics and Spearman correlation analysis for the correlation between criteria.

**4. RESULTS**

**4.1. Descriptive statistics**

Descriptive statistics for the characteristics are presented for all subgroups of the WELL Building Standard. Descriptive statistics were calculated for all variables (Table 1). The percentages were calculated for categorical data according to the survey. 100 completed questionnaires were processed to analyze the WELL Building Standard COVID-19 Criteria. The authors gave the codes to the criteria set in later data analyses.

Here, 100 students were asked whether they knew about these criteria and whether there was an example in their built environment about these criteria. Almost 80% of students know about A1, A2, and B1 criteria, and they know these criteria in the built environment during the pandemic. It has been seen in these analyses that they have 70% knowledge about C1, D1, E1, F3, F5, and G2 criteria. G2, H1, F6, and B2 are the criteria that students obtain the least information from the media, such as posters, advertisements, etc., in their built environment.

**Table 1.** WELL, Building Standard Strategies, COVID-19 Criteria Analysis

	Code	WELL, Building Standard Strategies, COVID-19 Criteria	Mark, if you know about the criteria %	Mark if there are examples in your built environment %	Percentage s %
A	A1	Handwashing	90	68	76
	A2	Cleaning Products & Protocol	82	65	79
B	B1	Reduce indoor air quality issues by providing adequate ventilation and filtration 1. Ventilation Effectiveness 2. Enhanced Ventilation 3. Operable Windows 4. Air Filtration 5. Microbe and Mold Control	74	46	62
	B2	Manage humidity and control sources of indoor moisture 1. Moisture Management 2. Humidity Control	51	17	33
C	C1	Test your water to ensure it's safe for use 1. Fundamental Water Quality 2. Water Contaminants 3. Enhanced Water Quality 4. Water Quality Consistency	66	30	45
D	D1	Prepare for emergencies 1. Emergency Preparedness 2. Family Support	67	19	28
	D2	Be informed by evidence. 1. Occupant Survey 2. Enhanced Occupant Survey	56	19	34
E	E1	1. Visual and Physical Ergonomics 2. Active Furnishings 3. Enhanced Ergonomics 4. Self-Monitoring	65	27	42
F	F1	Offer physical and mental health benefits 1. Health Services and Benefits 2. Mental Health Support	60	31	52
	F2	Cultivate a culture of health 1. Health Promotion	59	19	32
	F3	Mitigate the risks of smoking	70	36	51

		1. Smoke-free Environment 2. Tobacco Prevention and Cessation			
	F4	Stay nourished and hydrated. 1. Fruits and Vegetables 2. Drinking Water Promotion	77	34	44
	F5	Enable physical activity throughout the day 1. Physical Activity Opportunities 2. Physical Activity Spaces and Equipment 3. Physical Activity Promotion	72	37	51
	F6	Promote healthy sleep habits 1. Circadian Lighting Design 2. Sleep Support	53	16	30
G	G1	Maintain mental health 1. Mental Health Promotion 2. Mental Health Education 3. Stress Support 4. Restorative Opportunities 5. Restorative Programming	52	23	44
	G2	Provide access to nature and natural light 1. Access to Nature 2. Enhanced Access to Nature 3. Light Exposure and Education 4. Enhanced Daylight Access	65	17	26
H	H1	Support local communities and foster community connections 1. Civic Engagement 2. Community Access and Engagement	45	17	38
	H2	Provide access to localized food sources 1. Food Production 2. Local Food Environment	53	20	38

**4.1. Spearman correlation statistics**

Correlation analysis was performed to determine whether there is a relationship between the two data discussed above according to the descriptive analysis and, if so, the severity of this relationship. First, the normal distribution test of the variables was performed. Accordingly, the correlation to be applied was decided. Since the normality test is greater than 30, Kolmogorov-Smirnov was applied, and the data

distribution was not normal. In this case, where the data are not normally distributed, the Spearman Rank correlation coefficient is preferred.

Table 2 presents the results of the Spearman Correlation test applied to determine the relationship between WELL's Building Standard Strategies COVID-19 Criteria and its sub-dimensions. The relationship between the variables is weak if the correlation coefficient is between 0-0.29; medium if it is between 0.30-0.64; and strong if it is between 0.65-0.84 (Ural & Kiliç, 2005). Here, the correlation test prepared for two separate questions is presented together. The upper cross shows the analysis for the question "Mark if you know about criteria." In contrast, the lower cross shows the correlation within the question "Mark if there are examples in your built environment." All values processed to this figure are significant at the 0.01 level ( $p=0.000<0.01$ ).

There is a strong, positively significant relationship between "Offer physical and mental health benefits" F1 and "Maintain mental health" G1 and between "Handwashing" A1 and "Cleaning Products & Protocol" A2. In addition, there is a strong, positive relationship between G1 and H1/H2. A weak and positively significant relationship exists between A1 and F3, F4, and F5. In general, the relationships are moderate, positively significant relationships.

**Table 2.** Correlation analysis for WELL Building Standards COVID-19 Criteria

	A1	A2	B1	B2	C1	D1	D2	E1	F1	F2	F3	F4	F5	F6	G1	G2	H1	H2
A1		0.68																
A2	0.31																	
B1																		
B2			0.48															
C1			0.35	0.39														
D1			0.31	0.45	0.51													
D2			0.34	0.34	0.45	0.63	0.41	0.32										
E1			0.47	0.27	0.56	0.39	0.48	0.41										
F1			0.44	0.41	0.44	0.27	0.55	0.46	0.29									
F2			0.37		0.37		0.39											
F3			0.38		0.31	0.29												
F4			0.35		0.35	0.41	0.28	0.29										
F5			0.48		0.58	0.58	0.28	0.46										
F6			0.41		0.47	0.51	0.43	0.59	0.3	0.35								
G1			0.47		0.47	0.47	0.27	0.46	0.58	0.37	0.49							
G2			0.52		0.51	0.51	0.34	0.51	0.34	0.58	0.29							
H1			0.54		0.54	0.52	0.4	0.57										
H2			0.62		0.62	0.62	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49

## 5. DISCUSSION

In the COVID-19 period and in the post-pandemic period, many studies have been conducted on compliance with the rules, perception, awareness, and adherence to measures. Opinions about the COVID-19 preventive measures of university students were taken against the measures taken to improve public health discussed in this study, and the results are in line with the literature discussed below.

According to the study conducted at Purdue University in the USA, online survey results of university students' perception, awareness, and adherence to COVID-19 prevention measures were investigated, and in general, students accepted protective measures. However, the protocol violation effectiveness of those who tested positive for COVID-19 was higher. Women and graduate students were found to have a higher percentage of participation and compliance with the instructions (Akhter et al., 2022).

In a study about self-reported productivity before and after relocation into WELL-certified office buildings, a statistically significant improvement was observed in indoor air quality satisfaction, thermal comfort, and awareness of WELL certification, according to the study conducted on an office building upgraded with Well certification (Licina & Langer, 2021).

In the study conducted in Uganda, the effects of awareness of COVID-19, the adoption of prevention measures, and the COVID-19 quarantine on mental health and socio-economic disruptions were evaluated on the participants. According to this study, the participants reported that health problems increased due to the COVID-19 quarantine, balanced nutrition was difficult, disturbed sleep patterns, and socio-economic disruptions and sedentary life were caused. In addition, while 40% of the participants washed their hands more, 17.6% started to avoid entering public areas (Akhter et al., 2022).

According to the awareness research conducted on dentistry students, they pay more attention to precautions such as washing their hands frequently, maintaining a safe distance, and wearing masks (Akhter et al., 2022).

According to the study, which analyzed the demographics associated with awareness and compliance with Vermont in USA adult residents and identified characteristics associated with non-compliance, most respondents listed their primary motivation for following recommended public health actions as protecting their health, the health of their family and friends, and the health of other Vermonters. While Vermont residents demonstrated a high level of awareness of the COVID-19 guidelines and adherence to actions to limit transmission, the emergence of the COVID-19 Delta variant has shown that those who do not take the guidelines seriously or adhere to limiting actions are not in the minority (Vatovec & Hanley, 2022).

In addition to these studies, many studies show that COVID-19 measures cause some environmental problems. Considering these studies, it is seen that water use has

increased more. According to research on the increase in water use during and after COVID-19, water consumption in the DMA increased by more than 50% during the lockdown, with a corresponding increase in electricity bills (Almulhim & Aina, 2022). In the study of Abu-Bakar et al, water consumption increased by 46% in England during the lockdown. In another study, the increase in household water consumption was calculated to be between 15% and 20% (Abu-Bakar et al., 2021).

When we look at the studies mentioned above, similar trends are seen in university students in this study. It was understood that the samples received more information, especially about promoting clean contact and air quality, saw posters and brochures and were more informed about the COVID-19 pandemic. It is seen that students have information about "water quality," but only 45% get information about it via communication tools. When we look at the results of the "movement," the "stay at home" rule is more dominant, and only half of the students do sports during the pandemic period. Whereas supporting the immune system is of great importance for all diseases. In this period, 77 students declared that they paid attention to the issue of nutrition. 53 out of 100 students experienced sleep disorders. Moreover, according to the survey results, 52 students received psychological support throughout this period.

As a result of this analysis, it can be concluded that besides informing students to create awareness, spaces should be designed accordingly so that they can also experience precautions' benefits in their daily lives. For example, more health spaces may be designed to improve physical and mental health; more cleaning zones can be designed to achieve clean contact; the more mechanical system can be improved using technological improvements in the living spaces, especially in study areas. With these spatial and design precautions, students know and experience this knowledge in space.

## 6. CONCLUSION

Referred to the more rigorous period of lockdown in Turkiye as a security measure adopted to contain the COVID-19 pandemic, our study highlights the awareness by the university students against the Pandemic by WELL Building Standard COVID-19 Criteria. This certificate brings the health dimension to the green building concept much higher than the known certificate systems for the design and operation stages. It is a performance-based certification system that measures, certifies, and monitors the elements of the building and built environment that affects human health and is audited by independent organizations. This certification system is examined in 10 concepts focused on human health. Air, Water, Nourishment, Light, Movement, Thermal Comfort, Sound, Materials, Community and Mind. By transforming buildings into tools that help improve public health and allow users to protect themselves better indoors, this certification system can help reduce the risk of spreading the contagious disease. For this reason, the criteria determined by this certification system were asked of 100 students living in different cities in Turkiye. It was

analyzed by surveying whether there is information about the criterion and whether there are posters, information etc., in their built environment.

The results show that many respondents had high levels of awareness regarding COVID-19 measures in the built environment, such as social distancing and proper ventilation. Moreover, most participants reported they are more likely to follow safety protocols when they know it is an architectural decision designed to reduce pandemic spread. It is clear from the responses that post-pandemic spatial decisions will be greatly influenced by the level of knowledge and understanding university students have concerning architecture's role in keeping them safe during times of global health crisis.

Consequently, architects must not only continue to build spaces with improved hygiene and enhanced air quality but also employ creative and innovative solutions that foster increased awareness of safety measures among university students. These may include designing colorful instructional signage, using social media to highlight the connection between health protocols and architecture or even encouraging hands-on workshops for student groups to learn about air filtration systems and healthy building materials. With greater visibility surrounding safety precautions in the built environment, university administrators can empower students to make informed choices while navigating the built environment.

Finally, the WELL criteria set, accepted as a support material for adaptation to pandemic circumstances, using space and creating awareness of COVID-19, is an important proposal for the built environment against pandemics encountered worldwide. Users' behaviors and spatial requirements of built environments considering COVID-19 precautions will contribute to developing project ideas for designers, architects, and engineers by raising awareness against pandemics such as COVID-19.

#### **Ethics Committee Approval**

Ethics committee approval was received for this study from the Social and Human Scientific Research Ethics Committee ----- Science and Technology.

#### **Peer-review**

Externally peer-reviewed.

#### **Author Contributions**

Conceptualization: T.P.; Investigation: T.P.; Material and Methodology: T.P., M.A.; Supervision: T.P.; Visualization: T.P.; Writing-Original Draft: T.P., M.A.; Writing-review & Editing: T.P., M.A.; Other: All authors have read and agreed to the published version of the manuscript.

#### **Conflict of Interest**

The authors have no conflicts of interest to declare.

#### **Funding**

The authors declared that this study had received no financial support.

## **REFERENCES**

- Abu-Bakar, H., Williams, L., Hallett, S. H. (2021). Quantifying the impact of the COVID-19 lockdown on household water consumption patterns in England. *NPJ Clean Water*, 4(1), 13.
- Akhter, S., Robbins, M., Curtis, P., Hinshaw, B., Wells, E. M. (2022). Online survey of university students' perception, awareness and adherence to COVID-19 prevention measures. *BMC Public Health*, 22(1), 964.
- Almulhim, A. I., Aina, Y. A. (2022). Understanding household water-use behavior and consumption patterns during COVID-19 lockdown in Saudi Arabia. *Water*, 14(3), 314.
- Burton, A., McKinlay, A., Dawes, J., Roberts, A., Fynn, W., May, T., Fancourt, D. (2022). Understanding barriers and facilitators to compliance with UK social distancing guidelines during the COVID-19 pandemic: A qualitative interview study. *Behaviour Change*, 1–21.
- Casacchia, M., Cifone, M. G., Giusti, L., Fabiani, L., Gatto, R., Lancia, L., Cinque, B., Petrucci, C., Giannoni, M., Ippoliti, R., & others. (2021). Distance education during COVID 19: an Italian survey on the university teachers' perspectives and their emotional conditions. *BMC Medical Education*, 21(1), 1–17.
- Emür, S. H., Onsekiz, D. (2007). The importance of open and green areas in the components of urban life quality-the analysis of park areas in Kayseri/Kocasinan District. *Erciyes University. Journal of Social Sciences Institute*, (22), 367, 369.
- Hermanto, Y. B., Srimulyani, V. A. (2021). The challenges of online learning during the covid-19 pandemic. *Jurnal Pendidikan Dan Pengajaran*, 54(1), 46–57.
- Iglesias-Pradas, S., Hernández-García, Á., Chaparro-Peláez, J., Prieto, J. L. (2021). Emergency remote teaching and students' academic performance in higher education during the COVID-19 pandemic: A case study. *Computers in Human Behavior*, 119, 106713.
- International WELL Building Institute. (2018). *The WELL Building Standard V2.0*. The next Version of the WELL Building Standard.
- Jones, E., Young, A., Clevenger, K., Salimifard, P., Wu, E., Luna, M. L., Lahvis, M., Lang, J., Bliss, M., Azimi, P., & others. (2020). Healthy schools: risk reduction strategies for reopening schools. *Harvard TH Chan School of Public Health Healthy Buildings Program*.
- Kalayci Önaç, A., Birisçi, T. (2019). Transformation of urban landscape value perception over time: a Delphi technique application. *Environmental Monitoring and Assessment*, 191(12), 1–24.
- Kristóf, Z. (2020). International trends of remote teaching ordered in light of the coronavirus (COVID-19) and its most popular video conferencing applications that implement communication. *Central European Journal of Educational Research*, 2(2), 84–92.
- Labartino, I. (2018). Building certification as a driver in green building design: The holistic approach of

## WELL.

- Lemay, D. J., Bazelais, P., Doleck, T. (2021). Transition to online learning during the COVID-19 pandemic. *Computers in Human Behavior Reports*, 4, 100130.
- Licina, D., Langer, S. (2021). Indoor air quality investigation before and after relocation to WELL-certified office buildings. *Building and Environment*, 204. <https://doi.org/10.1016/j.buildenv.2021.108182>
- Mikic, A. (2019). Building Wellness: Supporting Nutritional Health through Design and Policy...Food & Nutrition Conference & Expo, 26-29 October 2019, Philadelphia, PA. *Journal of the Academy of Nutrition & Dietetics*, 119(9), A61-A61. <https://search.ebscohost.com/login.aspx?direct=true&db=cin20&AN=138553677&site=ehost-live>
- Pekdogan, T. (2022). Design of learning spaces in the post-pandemic era. *International Journal of Sustainable Building Technology and Urban Development*, 13(4), 500 – 513. <https://doi.org/10.22712/susb.20220036>
- Pekdogan, T., Tokuç, A., Ezan, M. A., Başaran, T. (2021). Experimental investigation of a decentralized heat recovery ventilation system. *Journal of Building Engineering*. <https://doi.org/10.1016/j.jobe.2020.102009>
- Şahin, M. (2021). Opinions of university students on effects of distance learning in Turkey during the Covid-19 pandemic. *African Educational Research Journal*. <https://doi.org/10.30918/aerj.92.21.082>
- Ural, A., Kiliç, I. (2005). Bilimsel araştırma süreci ve SPSS ile veri analizi.
- Pekdogan, T. (2022). Design of learning spaces in the post-pandemic era. *International Journal of Sustainable Building Technology and Urban Development*, 13(4), 500 – 513. <https://doi.org/10.22712/susb.20220036>
- Vatovec, C., Hanley, J. (2022). Survey of awareness, attitudes, and compliance with COVID-19 measures among Vermont residents. *Plos One*, 17(3), e0265014.