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ISLAMIC BOARDING SCHOOL BUILDING DESIGN WITH A COVID-19 PROTECTION PROTOCOL

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ABSTRACT

Islamic Boarding School building functions as a place of education for prospective ulama who are expected to be the disseminators of Islamic religious knowledge to the wider community. Coronavirus transmission was very fast in 2019-2022, so Islamic boarding schools must appeal to the government's way of learning, one of which is to comply with the Covid-19 protection protocol. This study aims to get Islamic boarding school design with Covid-19 protection protocol. The method we did was survey and observation to initial research data, then made floor plans for the first and the second floors with AutoCAD according to a related party and expert ideas. Finally, with SketchUp Pro, a standard building design for the COVID-19 health protocol was obtained, such as the design of the top, 3D, side, and inside view. The design consisted of a bedroom in 8x8 meters with a height of 4 meters for 18 students with adequate ventilation and lighting. In every room and terrace, there is Covid-19 health protocol message. The area for hand washing with soap is located in the right and left wings of the bedroom. The stairs and doors for entry and exit are different. The rooms are arranged with one-way circulation of human movement. The corridor to come through the main stairs or the area near the bathroom goes down through the stairs near the ablution place. With this arrangement of beds, students' movement in the bedroom leads to another corridor from the direction of arrival. The students sitting on the bed can see the green view. They can move without colliding with each other, so it feels more relieved. They are targeted for activities in good health and lower disease transmission. As a result, students get more breathing space and behave more responsibly for personal health. For teachers and management, it is easier to carry out transmission tracing.

KEYWORDS:
Islamic Boarding School; Covid-19; design; protection protocol

INTRODUCTION

Architecture based on the Qur'an and Sunnah as the main heritage of the Prophet Muhammad is called Islamic architecture [1]. Islamic boarding schools are dormitories or guesthouses, or bedrooms as a place to live for students [2]. The Islamic Boarding School building functions as a transit place before the students get permanent residence or can even be a place to live as long as the students demand an Islamic religion-based education [3]. One of the other functions is to educate prospective ulama who are expected to be the successors/disseminators of Islamic religious knowledge to the wider community [4]. Education in Islamic boarding schools always provides students with knowledge about entrepreneurship in accordance with the form of life skills provided by each Islamic boarding school [5]. A comfortable and quiet Islamic boarding school is needed in the learning process. Calm in terms of safe and peaceful mind, heart, and so, while a comfortable Islamic boarding school can be obtained with aspects of the lighting system, acoustic system, and thermal comfort system [6].

In December 2019, the world experienced a global health crisis that spread to all national capitals, cities, and small towns. It requires governments, businesses, academics, professionals, and workers to find new ways for all of society to control the spread of disease and find vaccines. The ongoing task was, and is, to define the so-called new normal [7]. The coronavirus, which has a fast spread rate, has prompted people to renovate their homes, tiny and congested houses, by allocating land for their gardens and food production, providing space for social distancing, and installing house components for lighting and air circulation to optimize natural light in their homes [8]. In today's circumstances, staying at home is a good time to realize that gardens are very important in homes, even terraced houses [9] [10]. It is in line with regulations from the Indonesian

government to prevent the spread of the coronavirus, issuing policies to study from home, work from home, and worship from home [11]. Implementation of green community and green culture in learning methods has obtained maximum results. Governments and health experts suggest doing social distancing, physical distancing, and staying at home [12].

Environmentally friendly buildings or green buildings have the concept of creating a construction starting from the planning, implementation, and use of construction products that are environmentally friendly, efficient in the use of existing energy and resources, low costs, and health aspects are considered, the comfort of the occupants where everything adheres to the principles of sustainability [2]. In 2009, an independent (non-government) and non-profit (non-profit) institution established the Green Building Council Indonesia (GBCI), which is committed to public education in applying environmental best practices and has one program which is to certify Green Buildings in Indonesia based on a typical Indonesian assessment tool called Greenship [13]. Greenship has 7 (seven) standard aspects of assessment; appropriate site development, energy efficiency and conservation, water conservation, material resource, and cycle, indoor health and comfort, and management [3]. In the design of this Islamic boarding school, the walls are made as comfortable as possible so that they do not cause dampness on the surface. The floor is also installed with ceramics that are comfortable to live in the room [14]. Open space consists of green open space (RTH) and non-green open space (RTNH). RTH is an area that extends / lanes and/or clusters, which can be used openly as a place to grow plants, both naturally or intentionally planted; this is based on Undang-Undang Nomor 26 Tahun 2007 (Government Law Number 26 Year 2007) [15]. For the room to be fully functional, the designer must consider an important factor in the design of the space, namely lighting [16]. Natural lighting is measured using a Luxmeter to optimize natural lighting in the room, which is more than 300 Lux [17].

The study area is in Al-Ischakiyah Islamic Boarding School, Nameng Village, Rangkasbitung District, Lebak Regency, Banten 42300. This Islamic boarding school is located between road, land, and greenery, as seen on Google Earth in Figure 1 [18].

Figure 1. Google Earth of Al-Ischakiyah Boarding School [18]

Figure 1 has a big area for building an Islamic boarding school so that the leader can build a green school with Covid-19 protection protocol.

This is Based on "Surat Edaran Pimpinan Pusat Muhammadiyah di Jakarta, Desember 2020" (Announcement Letter from the Muhammadiyah Central Leadership in Jakarta, December 2020) regarding Standard Operating Procedures for Islamic Boarding Schools during a pandemic on pages 15-25 [19], which is in line with "Salinan Lampiran Keputusan Bersama Menteri Pendidikan dan Kebudayaan, Menteri Agama, Menteri Kesehatan, dan Menteri Dalam Negeri Nomor 01/ KB/2020, Nomor 516 Tahun 2020, Nomor HK.03.01 / Menkes/363/2020 Nomor 440-882 tentang Panduan Penyelenggaraan Pembelajaran di Masa Pandemic COVID-19" (Copy of Joint Decision Letter of the Ministry of Education and Culture, the Ministry of Religion, the Ministry of Health, and the Ministry of Internal Affairs Number 01/KB/2020, Number 516 year 2020, Number HK.03.01/Menkes/363/2020 Number 440 -882 about Guidelines for the Implementation of Learning in the Pandemic Covid-19 Period) [20] regarding the Covid-19 Protection Protocol that must be carried out by Islamic Boarding School residents and managers. Based on the explanation above, namely the needs of Islamic boarding schools forced by the Coronavirus, then the principle of Greenship is so that students get a comfortable environment. Therefore, the aim of this study is to get the Islamic boarding school design with a Covid-19 protection protocol, a case study in Al-Ischakiyah Islamic Boarding School which is expected to be a reference for Islamic boarding schools around the world.

METHODS

This research used a primary data source which was data collection obtained directly by the author from the Islamic boarding school by observation and survey methods [21]. The observation method used was visiting to the research location directly and then observing the plans and designs of the existing Islamic boarding school buildings. Meanwhile, the survey method conducted by the author was interviews with related parties regarding the current situation and conditions over there.

The author used quantitative and qualitative data types. Quantitative data were used to get a design in the SketchUp Pro software which requires data on the correct scale to obtain the building design before the Covid-19 pandemic. Then, with these data and types of qualitative data obtained through interviews and direct observation, the design of the Islamic boarding school building can be obtained in accordance with the standard Covid-19 protection protocol.

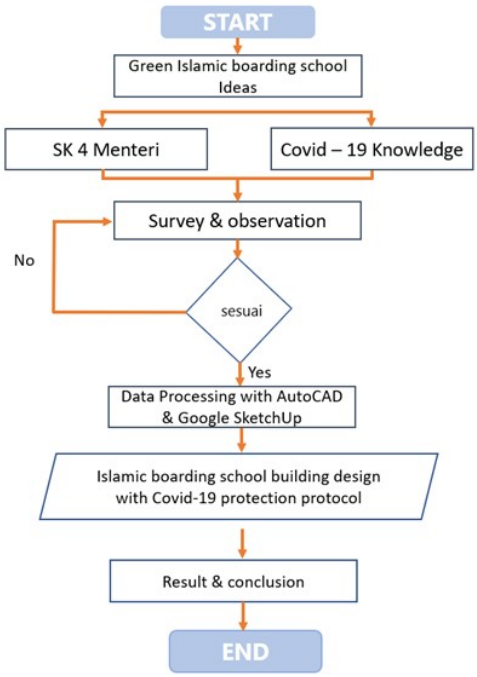
We will take steps following flow chart in Figure 2. It can be seen that the first thing the author does is a literature study on the idea of green Islamic green school, knowledge about the COVID-19 disease outbreak, which is strengthened by Salinan Lampiran

Keputusan Bersama Menteri Pendidikan dan Kebudayaan, Menteri Agama, Menteri Kesehatan, dan Menteri Dalam Negeri Nomor 01/KB/2020, Nomor 516 Tahun 2020, Nomor HK.03.01 /Menkes/363/2020 Nomor 440-882 tentang Panduan Penyelenggaraan Pembelajaran di Masa Pandemic COVID-19 point XIV tentang Pesantren dan Pendidikan Keagamaan pada SEMUA ZONA (Copy of Joint Decision Letter of the Ministry of Education and Culture, the Ministry of Religion, the Ministry of Health, and the Ministry of Internal Affairs Number 01/KB/2020, Number 516 year 2020, Number HK.03.01/Menkes/363/2020 Number 440 -882 about Guidelines for the Implementation of Learning in the Pandemic Covid-19 Period Point XIV about Islamic Boarding Schools and Religion Education in All Zone) [20].

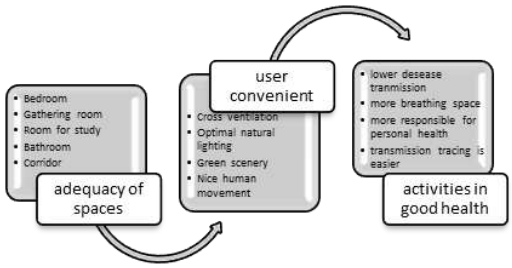
Then, looking for the required data by survey and observation to the research location; Al-Ischakiyah Islamic boarding school, such as top view plan, height of room, size of Cuci Tangan Pakai Sabun (CTPS) / Hand Washing with Soap (HWWS), to then be simulated into the google Sketch Up software (application) so the authors get the expected building design. If the design results are appropriate, then proceed with the next step; formulating the results and conclusions.

Data analysis was carried out based on data obtained during surveys and observations in the research field. The analysis techniques we use were developmental analysis and descriptive analysis. This type of development research studies the pattern of Islamic boarding schools before Covid-19. The building is adjusted to its design according to current developments, according to the standard covid-19 protection protocol.

The authors used descriptive analysis to describe the design of Islamic boarding school building before and after Covid-19 pandemic according to the results obtained using the SketchUp Pro. In this analysis, the authors provided recommendations on the implementation of designs that have been made suitable to be applied to Islamic boarding schools, especially in the building design that have been adjusted to standard health protocols reinforced by Salinan Lampiran Keputusan Bersama Menteri Pendidikan dan Kebudayaan, Menteri Agama, Menteri Kesehatan, dan Menteri Dalam Negeri Nomor 01/ KB/2020, Nomor 516 Tahun 2020, Nomor HK.03.01 / Menkes/363/2020 Nomor 440-882 tentang Panduan Penyelenggaraan Pembelajaran di Masa Pandemic COVID-19 point XIV tentang Pesantren dan Pendidikan Keagamaan pada SEMUA ZONA (Copy of Joint Decision Letter of the Ministry of Education and Culture, the Ministry of Religion, the Ministry of Health, and the Ministry of Internal Affairs Number 01/KB/2020, Number 516 year 2020, Number HK.03.01/ Menkes/363/2020 Number 440-882 about Guidelines for the Implementation of Learning in the Pandemic Covid-19 Period Point XIV about Islamic Boarding Schools and Religion Education in All Zone) [20].



(a) Research flowchart



(b) Research goal

Figure 2. Research flowchart and goal

From the survey and observation results to research location, it was found that the current state of the Islamic boarding school, namely the female and male Islamic boarding schools, has adjacent buildings. The location of the building is on higher ground, and the surrounding is beautiful with lots of plants, as shown in Figure 3. The existing building has not shown the Covid-19 health protocol because the dormitory has a size of 8 x 8 and is inhabited by 27 students. There is no health message about the correct way of HWWS, how to prevent transmission of COVID-19, cough/sneeze etiquette, and how to use a mask. In the figure marked with a yellow circle is a clothesline for the residents of the boarding school, the green circle shows the place for students to study, and the orange color shows the female student dormitories that are still clustered.

Figure 2B shows the stages of the design target, starting with planning a sufficient dormitory space, then perfecting the eco-design concept. The next step is increasing the space for the risk of transmission of the covid disease.

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Figure 3. Al-Ischakiyah Islamic Boarding School (Existing)

DISCUSSION

Based on the results of the survey and author's observations in the field, it was found that data needs from the Islamic boarding school were related to the size, land, and building design models adapted to the Covid-19 protection protocol in its environment. The male and female Islamic boarding schools have the same design, consisting of 2 floors. In addition, there are HWWS facilities at each entrance, and messages for proper handwashing and for prevention of Covid-19.

Figure 4 shows the 1st floor Islamic boarding school building plan for Covid-19 using AutoCAD. The picture is marked with a yellow circle. There is a design for a bathroom with a total of 12 bathrooms. Then, in front of the toilet, there is an open space/lobby that can be used for the needs of students—as for the gray markings indicating the area of the stairs that can be used by the occupants of the Islamic boarding school to go to the 2nd floor. The red lines represent the chairs on the terrace that students use to study every day. Among the terraces, there are rooms for 18 students. The bed design is triple bunk beds, designed according to the current Covid-19 conditions. The blue sign is the stairs down for students on the 2nd floor so that the students who go up and down do not touch each other. It is highly recommended that efforts to prevent the spread of Covid-19 can be controlled.

Figure 5 shows the top view of the Islamic boarding school building design with COVID-19 protection protocol with SketchUp Pro. The image has the same marker as Figure 4. However, in this figure, the 2-dimensional process using Sketch Up Pro looks more accurate than the image that has been designed using AutoCAD. The color gradation and design shown in this image are almost the same as the expected original design. Also seen in the bedroom, there are storage cabinets in the front and back of the room. Storage cabinets are designed for each student so that it is hoped that there will be no contact between one student and another, even though they are in the same bunk bed. Near the stairs down (blue marker), there is also a place for ablution for the students. The rooms are arranged with the one-way circulation of human movement. The corridor comes through the main stairs or the area near the bathroom. The corridor goes down through the stairs near the ablution place. With this arrangement of beds, students' movement in the bedroom leads to another corridor from the direction of arrival, like an orange line

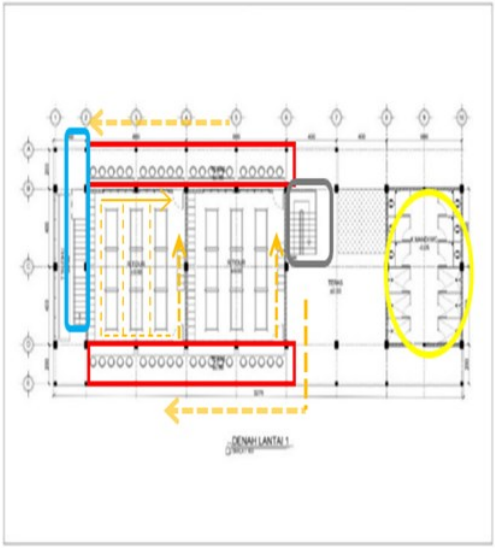

Figure 4. The 1st floor Islamic boarding school building plan for Covid-19 using AutoCAD

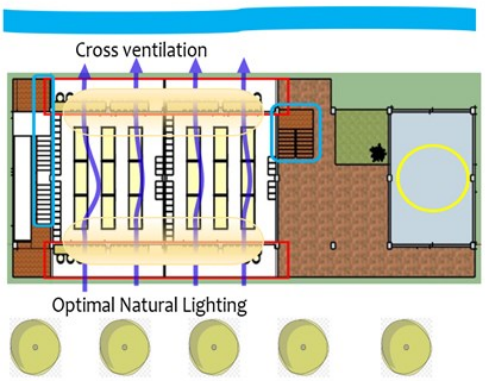

Figure 5. Top view design of Islamic boarding school building with COVID-19 protection protocol using Google SketchUp

Figure 5 illustrates the results of the second stage of the concept, the application of natural ventilation and lighting from the sun. Students sitting on the bed can see the green scenery. Students move without colliding with each other because of one direction, so it feels more relieved. With these favorable site conditions, the direction of the air enters through many plants, so the quality of the air entering the dormitory becomes fresher. The bedroom air will move towards the small river because the temperature of the river water is easier to turn into hot during the day (air moves to lower pressure). This is natural cross ventilation.

Figure 6 shows the design of an Islamic boarding school building with COVID-19 protection protocol with a SketchUp Pro top view. The picture shows a 3-dimensional image of the 1st-floor design. The chairs, ventilation, and doors look more real than in the two previous pictures, namely figure 4 and figure 5. There are also doors that are designed differently as students' entrance and exit. If the left is the entrance, the right is the exit, and vice versa. It is expected that this will prevent the spread of Covid-19. Storage cabinets and bunk beds are also more clearly designed than in the previous picture.

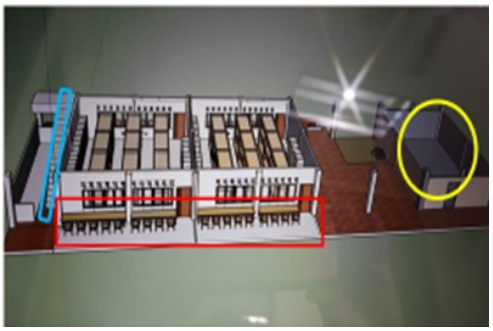

Figure 6. 3D Design of Islamic boarding school building with COVID-19 protection protocol with SketchUp Pro

Figure 4 shows the 1st floor Islamic boarding school building plan for Covid-19 using AutoCAD. Figure 5 shows the top view of the Islamic boarding school building design with COVID-19 protection protocol with SketchUp Pro. Figure 6 shows the design of an Islamic boarding school building with COVID-19 protection protocol with a SketchUp Pro top view. Three pictures show a 200-centimeter-wide terrace along with the boarding school building, indicated by the red color, namely 3260 centimeters or 32.6 meters on the north side and 2660 centimeters or 26.6 meters on the south side. The main room in the middle of the area, i.e., two bedrooms for students with a bedroom size of 8 x 8 meters, with a height of 4 meters. On the back and front sides of the entrance, there are storage areas (drawers/cupboards) for storing students' belongings. This bedroom has one entrance by the south side, one exit by the north side, and is occupied by 18 students.

Along with the main room, there is a terrace that the students will use to study. Nine students study on the south side terrace, and nine other students study on the north side terrace indicated by the red color on the figure, so the bedroom is only used for rest and sleep. On the right-wing, there are six bathrooms and six toilets indicated by yellow color with a total size of 6 x 8 meters; beside it, there is a shared area and a staircase that connects the 1st floor and 2nd floor indicated by the blue color. Because the design of this building is the standard Covid-19 health protocol, the stair is only used on the 2nd floor. On the left-wing, there is a place for ablution with a size of 260 centimeters, and there is a stair used to go down, indicated by the blue color.

Figure 7 shows the Plan for AutoCAD's 2nd floor. Its explanation is not much different from the explanation on the 1st floor. The difference is only in the function of the stairs going up and the stairs going down. Ventilation and doors are not visible for this AutoCAD.

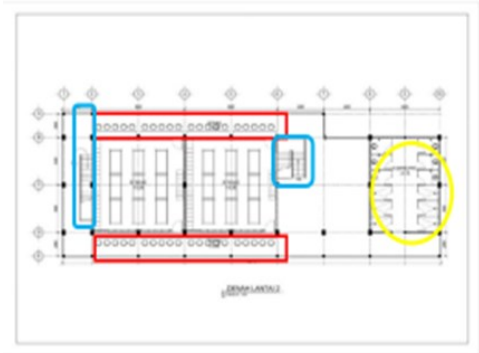

Figure 7. Plan of 2nd floor Covid-19 Islamic boarding school building with AutoCAD

Figure 8 shows a side view design of an Islamic boarding school building with COVID-19 protection protocol with SketchUp Pro. This picture shows that the ventilation and lighting levels are designed according to SNI-03-6575-2021, between 120-250 lux [22]. If the natural lighting entering the bedroom is excessive, it can be assisted by using a shading device to obtain lighting that is in accordance with the SNI, which is the reference. Likewise, if there is a lack of sunlight, it can be widened for ventilation and maybe for the design of entrances and exits using glass doors. Because students study outdoors, it is hoped that it will prevent the transmission of Covid-19. On the outer wall, there is also a message to avoid Covid-19.

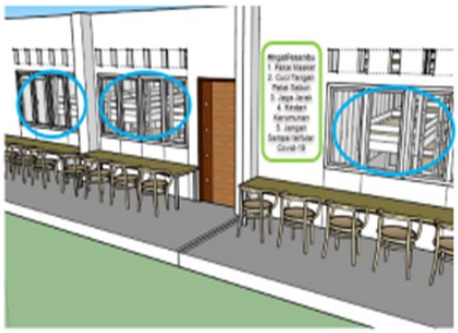

Figure 8. Side view design building with COVID-19 protection protocol

Figure 9 shows the interior design of the Islamic boarding school building with COVID-19 protection protocol with SketchUp Pro. The interior of the storage, ventilation, tables, chairs, bedrooms, and bunk beds for students is visible. There is also "Pesan Ibu" about preventing Covid-19 on the walls of students' bedrooms.

Figure 9. Interior view design of Islamic boarding school building with COVID-19 protection protocol with SketchUp Pro

The specification for the 2nd floor plan is the same as for the 1st floor, and the difference is only in the function of the stairs. The 2nd Floor plan can be seen in Figure 7. Meanwhile, Figure 8 shows a side view design of the Islamic boarding school building with COVID-19 protection protocol with SketchUp Pro, namely a terrace used for learning. This design shows that the ventilation and lighting design used in the bedroom is sufficient for air exchange indicated by the blue color. Orientation of ventilation or windows or openings is one of the factors that influence the penetration of natural light [23]. Plan of natural lighting on the terrace and bedroom according to GBCI Standard namely light intensity value is greater than 300 lux. There is also a Covid-19 health protocol message on each terrace, which the author took from the government's appeal, as indicated by the green color. During the learning process, the chairs are also arranged so that each student would also carry out the government's appeal through a song performed by "PADI" musician band entitled #IngatPesanIbu, i.e., to keep a distance from people around.

Figure 9 shows the interior design of Islamic boarding school building with COVID-19 protection protocol with SketchUp Pro. In front and behind the entrance is a storage area indicated by the orange color, and the bed is only used by each student, not shared. In front of the entrance room, there is also a Covid-19 health protocol message, which the author took from the government's appeal, as indicated by the green color. The goal is that every student also implements the government's appeal to comply with the New Normal regarding the standard Covid -19 health protocol. Namely:

1. Pakai Masker (Wear a mask),
2. Cuci Tangan Pake Sabun (Wash Hands with Soap)
3. Jaga Jarak (physical distancing)
4. Hindari Kerumunan (avoid the crowd)
5. Jangan sampai terular Covid-19 (don't get infected with covid19)

Besides being useful for Al-Ischakiyah Islamic Boarding School, Rangkasbitung, this design is also expected to be a reference for other boarding schools both nationally and internationally, so that it can help the implementation of education in Islamic Boarding School run as it should even with the current condition of Covid-19. With the implementation of green building, this dormitory is targeted for activities in good health and lower disease transmission. As a result, students get more breathing space and behave more responsibly for their personal health. For teachers and management, it is easier to carry out transmission tracing.

CONCLUSION

Islamic boarding school building design with covid-19 protection protocol and SK 4 Menteri (Decision Letter by 4 Ministry) that the bedroom measuring 8 x 8 meters with a height of 4 meters can accommodate 18 students with sufficient ventilation and plan of natural lighting according to GBCI Standard. The design is shown in the Figure 4 to Figure 9. There is also a Covid-19 health protocol message in every room and terrace. Washing hands with soap can be done on the right or left wing of the bedroom. The stairs and doors used for entry and exit are also differentiated to avoid exposure to disease between students. Suggestion for Islamic boarding schools to prevent transmission of Covid-19 among students is that it is hoped that the relevant parties from this Islamic boarding school will carry out the building design that we have designed because it has been adjusted to the covid-19 protection protocol and SK 4 Menteri (Decision Letter by 4 Ministry). With the implementation of green building, this dormitory is targeted for activities in good health and lower disease transmission. As a result, students get more breathing space and behave more responsibly for their personal health. For teachers and management, it is easier to carry out transmission tracing.

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