

# Analyzing the Effect of Corridor Space Use on Human Personal Space. Case Study: Second Floor Corridor of School of Creative Industries Building, Telkom University, Bandung

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**Abstract.** Corridor is a facility that can accommodate human activities to access a space to another space. This study focuses on examining the corridor space on the second floor of the Telkom University's School of Creative Industries building. Apparently, besides its main function as access to a space, additional functions have appeared indirectly in the corridor. The additional functions are as a sitting room, waiting room, discussion room, and so on. This thing can indirectly affect human personal space, especially those that use the corridor for its main function. This study focuses on examining the personal space of the main corridor users, namely people who use corridor according to its main function but then interrupted by secondary users. The secondary user in question is the user who uses the corridor as additional space such as for waiting, doing assignments, and so on. This research expected to provide an analysis of several things that can make the main user's personal space disrupted when using the corridor space by secondary users. The continuation of this research can be an appropriate reference as the basis for designing a corridor space based on human needs for it.

## 1 Introduction

The School of Creative Industries or the *Fakultas Industri Kreatif* (FIK) is one of the faculties of Telkom University (Tel-U) which is engaged in the field of Fine Arts and Design education, which focuses on developing education in 14 Creative Industries sectors. At first, Telkom University's FIK was a transformation of the Telkom Indonesian Institute of Fine Arts and Design (STISI Telkom) which has been active for more than two decades since it was founded in 1990. At the beginning of the establishment, Telkom University's FIK (previously known as STISI Telkom) has become a pioneer of private institutions that have the most comprehensive study programs in the field of art and design based on Information, Communication and Technology (ICT), which provide the ability for graduates to become a youth creativepreneur that have archipelago culture spirit. Telkom University's FIK has five excellent and most comprehensive bachelor study programs,

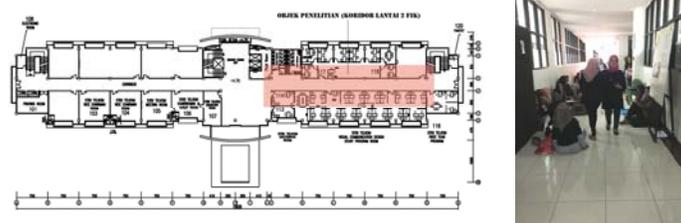
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namely Visual Communication Design (S.Ds), Interior Design (S.Ds), Product Design (S.Ds), Textile and Fashion Craft (S. Sn) and Fine Arts (S.Sn). (*sci.telkomuniversity.ac.id*).

FIK is located in a building with some facilities: lecturer room, administrative room, classroom, studio room, dean room, and several other supporting rooms. The shape of the FIK building is an elongated shape so it has a corridor on the left and right wing of the building. This building has five floors, where each of which has different facilities. The first floor is used for teaching and learning activities, academic, administration, student affairs, lobby, hall, mosque, and gallery space. The second floor is used for lecturer rooms (interior design, visual communication design, textile craft design and management, product design and fine arts), deans' room, vice dean room, HR and financial room, and prayer room. Third and fourth floor are used only for teaching and learning activities (theory and studio classes). In the fifth floor, there is a hall, some classrooms, work storage room and studios.

The object of this study focuses on discussing the corridor on the right wing of FIK building, especially on the second floor. The corridor discussed is a corridor spaces that located between two study programs, Interior Design (DI) and Visual Communication Design (DKV). This research object was selected because the study programs of DI and DKV have the largest number of students in FIK. This has resulted in a large number of students using corridor space to meet with lecturers, collect assignments, etc., so that the corridor space feels very crowded at certain hours.



**Fig. 1.** Second floor plan (left) and the corridor of FIK building (Source: FIK Website)

Now the corridor space that has function as an access to a room has additional functions such as; waiting facilities for students who want to go to the lecturer room, discussion place between students or students with lecturers, information facilities, and so on. These additional functions arise by themselves because of the needs of human activities in them, for example: the students use the corridor to wait for the lecturer, because it is closer. This is also due to the unavailability of waiting room facilities around the lecturers' room at FIK.

These unplanned additional functions can indirectly disrupt the corridor's main function as an access or user circulation to a room. For example, when the corridor space used as a waiting facility by students, they can sit on the floor and make their own private area (secondary users). It can interfere the user's comfort who is passing the corridor (main user). Main user's comfort can be disrupted due to several things, such as: the width of the corridor is narrowed because some space is used as a sitting space on the floor, users feel observed or supervised by users who are waiting, the corridor becomes noisy when more than two students are using the corridor as a waiting space, and so on. On the other hand, the corridor on the second floor of FIK building is designed only as an access space between rooms, not as a waiting space, discussion place, and so on, as can be seen from the absence of sitting facilities. These additional functions does not only interfere with the main users' comfort, but also users who are in the rooms adjacent to the corridor. With the basic premise that the activity on the second floor of the FIK building is working, so that the noise in the corridor can be felt into the workspace and cause discomfort when working. The research here is to analyze the additional functions that occur in the corridor, so that it can affect main user personal space. The main user in question is the user who uses the

corridor as its main function, while the secondary user is the user who uses the corridor as an additional function (waiting, discussing, etc.). Personal space referred here is in the form of a small domain as far as a human reach that everyone has the range in personal space is virtual but can be felt [1].

Based on the background described above, the formulation for this study refers to two basic things that influence human social processes: (1) how does the effect of corridor's additional functions on the personal space for main user? (2) What variables can interfere with the main user's personal space when passing through the corridor?

Based on existing theories, there are some conclusions that limit the research:

- This research only focuses on the main users when passing the corridor of the second floor of FIK. The main users are people who use the corridor of the second floor as its main function (access or circulation between rooms) which is disrupted by secondary users (people who use the second floor corridor of FIK building as an additional function, namely; waiting, sitting, discussion, etc.).
- For analysis of user behavior, the limitations in this study also focus on analyzing human personal space. The personal space studied only discusses the disturbances that occur in the personal space caused by interactions between users who do not know each other. This is a limitation so that a person's personal space cannot be reached by intimate kinship. If there is a kinship relationship, then the study results will have biased answers due to respondents who do not feel disturbed by the existence of these additional activities.
- The corridor examined here only focused on the second floor corridor on the right wing of FIK building, because the corridor was crowded more often than the other corridors due to students' activities of DI and DKV study programs. Besides, the DI and DKV study program has the largest number of students compared to other study programs, which indirectly causes activities in the two study programs be quite dense.

As for the purpose and benefits of this research, it can provide information about the effect of corridor use, which has additional functions to human personal space. These effects can be assessed according to the type of space user. In this study, the type of user is divided into two, namely the main user (the user who uses the corridor as its main function) which is interrupted by secondary users (users who use the corridor as an additional function). So that the results of corridor use effect on the main user are disturbed by additional activities carried out by secondary users. These results can be used as a basis for the better corridor space design, which is precisely adapted to human needs and activities.

## **2 Method**

To find the corridor space design's effect on human personal space, this study uses quantitative research with a determinative approach so that it is obtained whether the corridor space that has additional functions has a positive or negative effect on personal space as one of the basic human needs.

### **2.1 Stimulus**

This study uses a questionnaire that is equipped with pictures of corridor conditions during crowded times. The picture of the corridor condition is used as a stimulus to remind the respondent again about the corridor conditions that may have been forgotten or not carefully watched before.

## **2.2 Questionnaire**

In this study, researchers used an instrument in the form of questionnaire to get accurate results. The type of questionnaire used is a closed questionnaire, because the number of respondents is quite large (40 respondents), so it will be easier for researchers to analyze and process the data obtained. The closed questionnaire in question contains lists of questions where respondents choose the available answers. In the analysis measurement of the corridor space effects on human personal space, the answers to the questionnaire were arranged in stages. In order for the respondent's answers to be more detailed, the answers are made at five levels namely; strongly agree, agree, fair, disagree, and strongly disagree. In order for the questions raised to the respondents to be easily understood, the pre-test were conducted first. Pre-testing is done so that researchers can ensure that the questions to be tested get relevant answers. Pre-testing also intended to get variations of answers that appear for researchers to review the questions in the questionnaire. The questions written on the questionnaire sheet refer to the literature conclusions that produce six main variables (independent variables), which can affect human personal space (dependent variable) in a space, especially the corridor. The independent variables include size of space, design of space, sound, temperature, lighting, and crowding, while the dependent variable in this study is human personal space.

## **2.3 Respondent**

Respondents are bachelor students of the DI study program, FIK, Telkom University, Bandung, with an age range of 20-24 years. The reason for choosing the students as respondents is because they are considered to be familiar with the corridor space condition, both when the corridor is quiet and crowded, and the data also will be quite easy to obtain. The numbers of research subjects were 40 respondents.

## **2.4 Data Collecting Technique**

From above understanding, the first step starting this research is to collect data. Experiment on the causal relationship between the corridor space design and human personal space were conducted, whether the comfort of corridor space' main user are disturbed by its additional function. This can be assessed through investigation, direct research, or polling, which ultimately results in the questions contained in the questionnaire.

A large sample was used in this study, because according to statistical rules, the larger the sample, the more real conditions are presented. Because the quantitative approach in general requires a large sample, it requires sample stratification. A control group will be carried out for the comparison of the sample being studied. This is done in order to control the existence of confounding variables. The confounding variable in question is, if the sampling uses a user who has never passed through the second floor corridor space at FIK Building. In this research, the distance from the research subject will be taken. There is a relationship between subject and object. This is done to get a high level of objectivity and validity, because in practice, if the researcher has a relationship with the research subject that is built based on the results of trust, then the objectivity level that exists will have a likely less accurate validity value. For this reason, after describing various methods that will be used in this study, it is expected to provide results that can be used as a basis for designing corridor spaces that are adjusted to the characteristics and needs of users.

## **2.5 Data Analysis Phase**

Every answer of the questionnaire results will be entered into Microsoft Excel software database. Then the data processed through Excel and further processed on Google Form.

## **3 Literature Review**

### **3.1 Personal Space**

Personal space as an area with a virtual boundary that surrounds a person, and other people are not allowed to enter it [1]. Personal space is often likened to bubbles inside humans to restrict others from entering it. Personal space can change depending on who is the human being interacts with, the greater the personal space that is created indicates the further the relationship of intimacy between the humans. With this understanding, personal space can be an indicator of interpersonal relationships development [1].

Personal space also related to the distance of communication as a control over the interference that comes. Laurens divides the distance into 4 stages, namely:

- Intimate distance, near phase (0.00-0.15 m) and distant phase (0.15-0.50), usually for relationship between lovers, close friends, and family;
- Personal distance, near phase (0.50-0.75m) and distant phase (0.75 to 1.20 m), usually the distance for two friends or people who are already familiar;
- Social distance, near phase (1.20-2.10 m) and distant phase (2.10-360 m), are normal limits for individuals with similar activities or similar social groups;
- Public distance, near phase (3.60-7.50 m) and distant phase (greater than 7.50 m), for more formal relationships, such as distance to the speaker [1].

From the explanation of personal space above, it can be said that the corridor space is a public space but the distance of human's interaction that occurs within it is an intimate distance when it is used as an additional function. This certainly makes human comfort to be reduced and disturbed. To be able to help humans feel comfortable in a public facility with limited space, then sociofugal space is needed. Sociofugal space is an order that can reduce the occurrence of social interaction between humans [1]. Reducing the occurrence of social interaction is aim to make users who are passing through the corridor do not interact with each other and the comfort could be maintained, also the corridor user group as an additional function does not interact between groups to avoid noise. In the end, this research result can also used to consider the socifugal space so that human interaction in a corridor space can be in accordance with human needs in subsequent research.

The study of personal space in this research is about main users that passes through the corridor but get disturbed by secondary users who do not know each other. This is because if main users and secondary users knows each other or even has a high level of familiarity, the results of the study will slightly biased. That result is slightly biased because it is in accordance with the theory developed by Laurens, which is that the more someone feels familiar, the smaller personal space is formed [1]. With this premise, then the assumption of research is the disruption of personal space of the main users by secondary users does not have significant results.

### **3.2 Space**

Space is a slot bounded by walls and roofs that are real or imaginary. According to Haryadi, the effect of space on the user's behavior is quite clear, because the user carries out certain activities in each of these spaces [2]. In some cases, a lot of space is not clearly functioning

because many activities occur in it. Haryadi added there are two types of space that influence behavior, namely: (1) Space designed to fulfill a particular function and purpose; (2) Space designed to fulfill functions that are more flexible.

Both types of space have independent variables that can affect user behavior. In this study, corridor space can be said to be a type of space designed to fulfill a particular function and purpose. This can be seen from the corridor's design and size which only accommodate walking activities (two directions) to access one room to another, not for additional activities such as sit, wait, discussion, and so on. For this reason, what independent variables can influence the main user personal space is sought.

### *3.2.1 Size and Shape of Space*

Size and shape are fixed or flexible variables as space forming [2]. A space is said to be fixed if it is within a wall that cannot be changed, while it is said to be flexible if the size and shape can be changed according to activities occurred. According to Haryadi, in the design of space, size and shape adapted to the function to be accommodated, so the user behavior that occurs is as expected [2]. Space size greatly affects the user's psychology and shapes user behavior. As an example, narrow learning space will create a tight atmosphere and make users uncomfortable. In this corridor case, the corridor's size and shape is good enough to be used by two humans when walking (240cm), but becomes inefficient when used for additional functions.

### *3.2.2 Sound, Temperature, and Lighting*

Sound, temperature, and lighting are environmental elements that have a role in influencing space conditions and the users' behavior [2]. Sound variables measured through decibels have a negative influence on humans when they are too loud. For example, habitations adjacent to airport will disrupt the comfort of humans around it. There is also sound that can interfere other people's privacy, such as a classroom adjacent to the canteen.

Temperature is related to the room user's comfort [2]. The heat in a room can be caused by lack of openings for wind to enter a room, or a room that is too narrow to be used by many people. Likewise if the room is too cold, the user inside also does not feel comfortable. With the emergence of user discomfort in a space, the activities will not run as they should. Space temperature can also be affected by material, space openings and lighting. Lighting can affect a person's psychological condition [2]. A room that is not equipped with good lighting quality will affect the activities running in the room. For example, a room that is too dark for sewing activities will make it difficult for users to sew. Another case, a room that is too bright for leisure activities will make users not feel relaxed.

### *3.2.3 Crowding*

Crowding is related to density especially when there are a large number of people in a space. Crowding has a different meaning from density. According to Laurens, crowding cannot be measured objectively because it is a person's subjective feelings towards the surrounding environment [1]. As an example, someone who is accustomed to riding a train will not feel dense inside it even though there are many other passengers. In contrast, someone who is accustomed to riding a private vehicle will feel dense when riding a train with crowded passengers. Density is something that can be measured objectively without being influenced by human perception, such as population density.

Crowding is a subjective response to a tight space. Laurens added that crowding arises when there are certain disruptions or obstacles in social interaction or in an effort to achieve

a goal [1]. The case study in this research could be taken as an example, where the main users who use corridor space as access between rooms will feel crowded when the corridor space is filled with secondary users who use the corridor as additional functions, such as sitting on the floor, waiting, discussion, and so on, so that the main users cannot walk freely in the corridor.

For the corridor case study, the perception of crowding is not due to the room being too narrow (space density) but it is because the user is doing too much additional activity in the room (social density). There is a difference in perceptions about crowding between men and women. Through a laboratory study, it was found that men react more negatively towards crowding than women so their social behavior becomes abusive [1]. This makes women more able to withstand stress due to crowding. Another effect on crowding is the relationships quality that occurs in a room. Rooms filled by people with close relationships will not cause a sense of tightness, contrary to the space filled by people who do not know each other.

### 3.3 Conclusion of Literature Study

From some literature that has been obtained, it is concluded that there are several variables that can affect human’s personal space when they are in a space, especially the corridor space. These variables include distance between humans, size of space, shape of space, sound, temperature, lighting, and crowding. Distance variables related to the size of space, so these two variables are used as a single variable. As for crowding variables, it is still a general translation so when it used as a variable for question indicators on the questionnaire, crowding can be translated into several questions. Based on this, the independent variables that can affect human’s personal in this study are: size of space; shape of space; sound; temperature; lighting; crowding.

The variables that have been concluded are then become indicators for the questions in the questionnaire. The results of the questionnaire answers are then measured as a reference for perception and attitude when the human personal space is disturbed by additional activities in the corridor.

## 4 Analysis Result

Based on the results of data processing obtained through questionnaire, the corridor on the second floor of Telkom University FIK building turned out to affect the personal space of the main user. This chapter explains how the effect of corridor is in accordance with the previous related theories. In the questionnaire that has been distributed, there are 10 questions related to human personal space. The questions in the questionnaire refer to independent variables that affect the dependent variable.

### 4.1. Crowding Variable

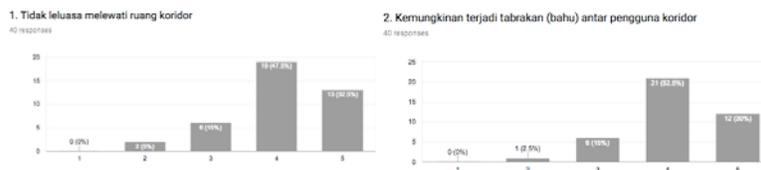


Fig. 2. Crowding Variable

As many as 18 respondents (47.5%) agreed that they did not feel free when they passed the corridor. The questionnaire gave significant results because there were 0% who strongly disagreed regarding question number one. This happened because some space in the corridor was used by secondary users to carry out additional activities (related to question number five). With less space to walk, the main users who pass through the corridor indirectly will feel not free. In accordance with the theory put forward by Laurens [1] that when human personal space is disturbed in public space, human comfort is reduced. The feeling of comfort that is reduced indirectly makes the main users are not feeling free to pass through the corridor space.

Personal space that can be disrupted also evidenced by the answers results of question number two, about the possibility of a bump (shoulder) between the corridor active users. A total of 21 respondents (52.5%) said they agreed that there might be a bump (shoulder) between corridor users, while there were 0% respondents who stated that they strongly disagreed regarding that statement, so that the results could be stated as significant. If one part of human body is in contact with another that is not desired, then it is certain that the human personal space is disturbed. The existence of these additional activities makes imaginary bubbles that envelop us and limit our distance to others [1] is interrupted, because the active users will bump (shoulder) when passing through the corridor.

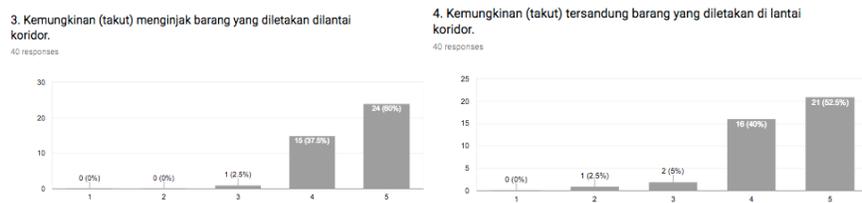


Fig. 3. Crowding Variable

The answer to question number three is 24 respondents (60%) strongly agree with statement #3, and no respondent (0%) strongly disagree. For the answer #4, the result is almost the same as question #3, 21 respondents (52.5%) stated strongly agree with statement number four, and no respondents (0%) stated strongly disagree. From the answers to these two questions, significant results were obtained. Therefore, it can be concluded that the existence of several activities carried out by secondary users indirectly makes the perception of active users cautious (in a negative context). Active users feel not free (related to question #1) because when they walk in the corridor, there is a feeling of anxiety about the possibility of falling or even damaging items that are not supposed to be on the corridor floor. Personal space in the corridor is included in the personal beta space category, namely as a subjective experience in the distance taking process [1]. In accordance with the results of the questionnaire obtained, the active user indirectly takes distance from the items placed on the corridor floor.

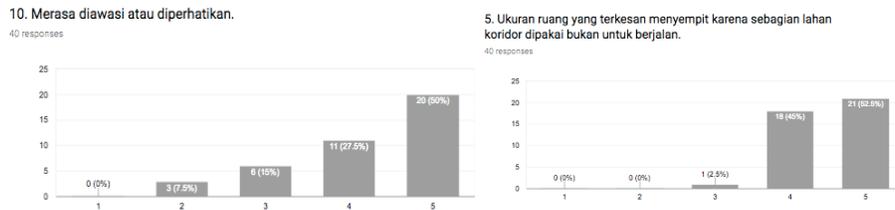


Fig. 4. Crowding Variable

Question #10 related to privacy that arises due to personal space. The privacy in question is the fact that the corridor is formed with the perception that corridor users are people who need access from a room to another room. By understanding these perceptions, if there are additional activities carried out by secondary users, then the main user perception automatically changes. Initially corridor users only interact (visually) with fellow corridor users, but then they have to also interact (visually) with secondary users. This turned out to make human personal space disturbed.

It can be seen from the questionnaire's answers that 20 respondents (50%) stated that they felt watched or noticed, so it can be concluded that question number 10 gives significant results. Humans feel watched or noticed in connected to statement of Laurens about privacy, that the environment can manipulate it [1]. The corridor environment should be manipulated so that main user perception is maintained, or there should be a provision that the corridor must be used in accordance with its function without allowing secondary users to carry out additional activities.

#### 4.2. Size of Space Variable

There are 21 respondents (52.5%) stated that the corridor space seemed narrowed due to these additional activities. The answer is significant because there are no respondents (0%) who strongly disagree with the statement from question number five. This question has a correlation with the question of crowding, but it has the influence of shape and size in a space. In accordance with the theory of crowding perceptions [1], crowding arises not because of a space is too narrow (space density), but because the user is doing too much additional activity in the room (social density).

##### 4.2.2 Shape of Space Variable



Fig. 5. Shape of space variable

The shape of the space that seemed to be more elongated due to the space to walk in the corridor narrowed. The space narrows as a result of some corridor space is being used for additional activities. With these additional activities in the corridor, 42.5% (17 respondents) agreed that the shape of the room seemed elongated, whereas no respondents (0%) stated strongly disagree, so it means the answer is significant. According to Haryadi, in the design of space, size and shape adapted to the function accommodated so that the user behavior that occurs is as expected [2]. The size of the space seems narrowed in the corridor not because the size is small, but the additional activities occurred there make it seem narrow. With the corridor shape seems to be elongated, the user feels crowded and uncomfortable when passing through the corridor. Question #6 is also related to questions #1, 2, 3, 4 and 5. The result of the answers related to the questions is significant, that is the main user is disturbed by the additional activities in the corridor.

##### 4.2.3 Sound Variable

The answer to question #7 is 21 respondents (52.5%) agreed that the sound intensity in the corridor is greater when used not just by users who walk there, while no respondents (0%)

stated strongly disagreed regarding the statement in question number seven. Thus, the answer has significant results. Judging from the answers result from the respondents it can be interpret that those additional activities in the corridor can interfere the main user audially. Audial comfort greatly affects human physical comfort. With the disruption of audial comfort, there are several possibilities felt by the main users when passing through the corridor, such as uncomfortable feeling because of the noise, uncomfortable with increased noise by secondary users, uncomfortable with vibrations that arise due to the increase of sound intensity in the corridor, and so on.

#### 4.2.4 Temperature Variable

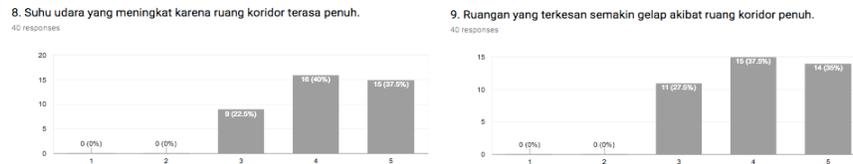


Fig. 6. Temperature of variable

From the questionnaire recap result for question #8, the results show that the average respondent agrees that air temperature rises when the corridor is full. It can be seen from the results of the respondents' answers, 16 respondents (40%) agreed and 15 respondents (37.5%) stated strongly agree with the indication in question eight, so the answer to question #8 is quite significant. Thus, it can be stated that the increased of air temperature can disrupt human personal space, especially the main users. The increase of air temperature indirectly affects the level of human comfort.

In accordance with Haryadi's statement that high temperature space makes humans feel hot, sweaty, and stuffy [2]. He added that in a hot room, the activities in that room will not work as planned [2]. The main user who is uncomfortable due to an increase in air temperature will have perception about the room. This perception indirectly makes the user take several possible attitudes when passing through the corridor. An explanation of the main user perceptions attitude will be discussed in the explanation of the respondent's attitude analysis results.

#### 4.2.5 Lighting Variable

The results of the questionnaire recapitulation related to question number nine is average respondents agreed that the corridor would appear darker due to the fullness of people using the corridor. It can be seen from the results of the respondents' answers that 15 respondents (37.5%) agreed and 14 respondents (35%) stated strongly agree with the indication of question number nine. Whereas, no respondents (0%) stated that they strongly disagreed regarding the statement on question number nine, so the answer was quite significant.

According to Haryadi, lighting can affect a person's psychological condition. Lighting quality that does not suit the room function can make the activities are not going well [2]. From the results of the respondents' answers, it can be seen that the existence of additional activities by secondary users caused the room conditions to feel darker. This may occur because: (1) An increasing number of people can accidentally cover or block the light sources; (2) An increase in the number of people automatically will increase the number of shadows in the corridor, and so on.

## 5 Conclusions

From the data analysis and data processing results, it was concluded that the second floor corridor, which has additional functions has a significant effect on human personal space. In accordance with the conclusions obtained from several theories related to personal space, several variables determine human personal space. These variables were tested into questions on the questionnaire, which finally gave answers about personal space. It is clear that respondents (students) responded and realized that when they passing the corridor, additional activities carried out by secondary users made their personal space disturbed.

The results of data analysis and data processing also provide answers about variables that can interfere with human personal space. From the data, variables that have a significant influence were obtained, namely variables related to crowding. Crowding variables have several indications listed in several questions on the questionnaire. It can be seen from the results of the answers related to crowding (in questions # 1, 2, 3, 4 and 10) including: (1) Do not feel free; (2) The possibility of bumping (shoulder) between corridor users; (3) The possibility (fear) of stepping on items placed on the corridor floor; (4) The possibility of tripping on items placed on the corridor floor; (5) Feel watched and noticed.

The answers to the questions produce answers that above 50% of users disturbed by the presence of these indications in the corridor. Whereas for space-related variables, namely size, shape, sound, temperature, and lighting also have an effect on human personal space but not as strong as the crowding variable. This can be seen from the results of data processing that produces answers around 40% to 52% about crowding variable.

## References

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2. B.S. Haryadi, *Arsitektur, Lingkungan dan Perilaku: Pengantar ke Teori, Metodologi, dan Aplikasi* (Gadjah Mada University Press, Yogyakarta, 2010)