SHARED SPACES IN A STUDENT DORM

A Post Occupancy Evaluation

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Abstract. Globally dormitories are popular accommodation types for students. A great number of Iranian dormitories have been built with rooms either side of a central corridor as a simple, affordable building form. Highly populated shared rooms with common facilities in such buildings can produce problems in terms of personal space but also have many advantages for social interactions and better use of resources, which is a feature of sustainability. However, most of these buildings are old and need refurbishment and guidelines are needed to improve this type of dormitory. The advantages and disadvantages of shared spaces have been analysed using “Post Occupancy Evaluation” in a case study representative of more than 30 university dormitories in Iran, a country whose domestic architecture has shared and multi-use spaces. The results lead to suggestions for more efficient shared spaces for future designs and for improving the case study dorm in terms of access hierarchy and internal room arrangements.

Keywords. Student accommodation, privacy, resident satisfaction, security, shared space, territory

1. Introduction

Globally university run student hostels (dorms in Iran) are the preferred accommodation for many students. An economical dorm plan found in most Iranian universities has rooms either side of a central corridor. The experience of living in such a dorm for a year indicates that resident students face many social and mental problems. The spatial organisation together with often having several residents in one room, has led students to refurbish their rooms and move some daily activities outdoors. Sharing space has advantages, such as improved social interactions, but there seem to be limits on the acceptable number of users and how shared spaces are organised. Many
of these dorms are old and their refurbishment should be done based on study of the existing situation to improve advantages and control disadvantages of this building type (Amole, 2009 and Hassanain, 2008). This paper presents an investigation into such an Iranian dorm using Post Occupancy Evaluation (POE) techniques, with a focus on how space is shared. Sharing space is an attribute of sustainability, since it leads to more efficient use of resources (Vale and Vale, 2009; 2013). This paper ends with suggestions for simple solutions to existing problems and for future designs.

2. Background


3. A brief review of the case study:

This building form is popular in many Iranian universities, with 20 dorms of this type found in just 6 universities. This case study is Boy’s dorm number one of Yazd University. It has five storeys including a basement level, and a central corridor (Figure 1), with half the rooms facing north and half south. The floor plan is repeated from ground to third floor, while the basement has a room for praying and watching TV, storage and a boiler room. Two staircases link the residential floors and students must use the ground floor corridors to access upper levels.
Each room for 4 students is a 20m² square with two $2 \times 1$ rectangles added for two bunk beds, with adjacent rooms sharing a 3.5m² balcony. When the study was done most rooms housed 5 students, and had 5 wooden lockers, 4 fixed and 1 movable bed, 2 bookcases, 1 desk with chair and 1 shoe holder. Every 5 rooms share a fridge in the corridor. All students are male.

4. Methodology

The evaluation uses POE (Rabinowitz, 1979:414) and data was collected via observation, interview and a questionnaire. Observation meant talking and living with students and collecting voice recordings and photographs, writing notes and drawing plans. In support a paper questionnaire was given to a cross-section of 100 students, from different storeys, sides of the building and distances from common kitchens, toilets and baths). All questionnaire answers were analysed using SPSS software with the help of a statistician. The functional and behavioural factors of the dorm were then evaluated.

6. Analysis

**Functional analysis:** The linear plan means the central corridor must be crossed to access rooms and public spaces, generating noise. Rooms at the end of the central corridor on all levels are quieter than those towards the centre of each storey. Common spaces are also at the centre and student satisfaction increases with decreasing distance from these with the highest satisfaction level for kitchen, baths and toilets of 25.5, 18.9 and 22.2m respectively. This difference could relate to bad ventilation of kitchen and toilets and its effect on nearby student rooms, while baths do not have this problem. Amole (2009) also found student satisfaction increased as length of corridors decreased.

**Circulation:** One set of staircases gives access to residential rooms and the to the public spaces in the basement, so all upper level residents must cross lower level corridors to access rooms and facilities, which can be noisy.
Analysis shows a relationship between storey number and corridor noise. Residents of the ground floor have the most and of the third floor the least problem with corridor noise, with problems occurring for respectively 76.5% on ground, 57.1% on first, 40.7% on second and 20.4% on third floor.

Analysis also shows 65.8% of students believe the best level is the first floor because of easier access and less corridor noise, while 45.6% believe the ground and 50.0% the third floor are the worst levels, probably relating to noise in the former and number of stairs to reach the latter. A study by Najib and Yusof (2009) indicates higher satisfaction in quieter study environments in student accommodation. In this study first floor students are the most satisfied with their rooms (71%) and third floor residents (59%) the least. However, at all levels more than half the students are satisfied. This contradicts findings of Kaya and Erkip (2001) that students living at higher levels were more satisfied with their rooms, feeling these were larger and less crowded than those on lower levels. It seems other parameters like noise and easy access affect student satisfaction more than perceived privacy.

**Human factors:** Residential rooms should fulfil daily physical needs (eating and sleeping), mental needs (privacy and interaction) and private activities (listening to music and talking on the phone). Observations show many of these functions cannot happen well in the rooms and residents go elsewhere, such as outdoors or to friend’s houses, to fulfil their needs. Amole (2005:211) calls this “avoidance and withdrawal”, indicating a poor relationship between the room and its necessary functions.

Human factors also relate to furniture. In this study 6.16m² of 16m² (room area without spaces for bunks) is filled by fixed and movable furniture. Usually other furniture items are brought in by students, worsening the situation, as at best the available area is less than 2m²/student (4m² with furniture including bunks), far below the international standard of a 9-15m² one bed/study space and 13-19m² two bed/study (Neufert, 1980). The shared kitchen, baths and toilets are well designed, apart from odour control issues, although the use rate of 1 toilet/16 students and 1 bath/13 students is below international standards of 1 toilet and 1 bath/6 students (Neufert, 1980).

**Storage:** The dorm rooms lack storage, contributing to their crowded appearance. Students put their books, stationery, food, kitchen wares, and clothing on their beds, in suitcases, on the balcony, in bookcases and even in the shoe cases. Amole (2009) found a relationship between adequate storage space and resident satisfaction in student housing in Nigeria.

**Flexibility and change:** Flexibility can be seen from different perspectives. The 4 person rooms are not flexible in terms of adding an extra student. Observations and interviews show all residents think the fifth person and his furniture and goods makes the room untidy. In some cases the fifth member
uses a floor mat for sleeping as this can be rolled up and stowed on a bunk so the room seems tidier (See Figure 2). However, being a reinforced concrete column and beam system the building has potential flexibility which has not been used to absorb the extra students, as no walls were changed. Students have rearranged the furniture to solve problems with the room. In most, the wooden lockers are now in front of the door to control looking in (see Figure 2) suggesting some flexibility in the furniture setting.

6.1. BEHAVIOURAL ANALYSIS

**Building use:** The most important matter here is whether each space in the building is used as the designer envisaged. Consequently, all spaces were analysed via observation and questionnaire.

As suggested earlier many normal student activities, like studying, sleeping and eating, cannot happen well in the rooms. Their shape, size and capacity mean each occupant can normally be seen by others, so has to move elsewhere for private activities. For example, corridors are full of students using mobile phones to avoid being overheard. The questionnaire asked students to list activities which cannot happen in their rooms and where they do these. Answers show students use outdoors/friend’s room for smoking, somewhere out of the room for thinking, friend’s room/balcony for listening to music, outdoors/bath for singing, bath/outdoors for crying and friend’s room for swearing.

Studying is highly associated with student satisfaction (Najib and Yusof, 2009) but because of crowded rooms and corridors, studying in the dorm is difficult. According to the survey, the best times for studying in private rooms are 8.00-11.00, 14.00-17.00 and 22.00-24.00, when others are sleeping or attending their courses. The worst times for studying are 11.00-14.00 and 18.00-21.00, when classes end and students return to their rooms for lunch, rest or dinner. More than 30% say they study less than 4 and 74% less
than 8 hours in their rooms, and only 26% think their situation is good for studying more than 8 hours a day. Students have found other study spaces. A study by Amole (2005) showed crowded rooms most affected student study.

Balconies are flexible spaces in this dorm. Figure 1 shows each room has access to a balcony, normally shared but private for corner rooms, although some ground floor rooms have no balconies. Activities that happen on these include storing extra items, listening to music, smoking, drying clothes, looking at views, studying, sleeping on summer nights and private thinking. However, balcony use differs between being private and common, and with aspect and storey number. For instance, common balconies are more used for looking at views and studying, while private ones are more used for sleeping on summer nights and storage. Direction also influences activities as south facing balconies (82.5%) are more used for looking at views than northern ones (72.5%). Storey number influences activities, as upper levels are more used for looking at views, and ground floor balconies much less used than those of the three upper levels for studying. Privacy, direction and storey number do not influence activities such as drying washing.

The common space for praying and television in the basement does not have good natural light. The floor of the room is carpeted and the only content is the wall-mounted television, but there is a very good thermal situation both summer and winter. Observations at different times of the day over a number of days showed this room was used less for praying (as Islamic regulations allow daily prayer anywhere) or watching TV and more for personal study, group study, resting and listening to music. It seems that students fulfil personal activity needs here as it is more private and quieter than their rooms. In the survey students ranked six spaces they would use for study during the day if not their private rooms. The praying and TV room is first choice for 20.0% of students, although the first ranked choice (52%) was the study saloon, located 200m from the dorm. Scaled averages indicate that study saloon, praying and TV room, library, outdoor spaces of the dorm, friend’s room and friend’s house are respectively the preferred study spaces.

Proximity and territory: Territory behaviours influence function and security. Because of the overcrowded rooms, personal territories are not well defined, leading to problems. When students were asked “How much and which parts of the room belong to you?” 10.5% said only their bunk and 49.5% their bunk and wooden locker. Interestingly nearly a third of students (30%) felt they had ownership of the whole (shared) room. It seems in most cases the private room belongs to its five residents and is semi private. The bunk space, although not well defined, is personal space that others are not allowed to enter. This has led to further defining this territory by screening it
with a curtain or movable barrier like a bookshelf (Figure 2). In some cases, students have their own lights and bookshelves in their personal ‘made’ space. Amole (2005:213) also found “rearranging furniture provided” was a strategy most used by male students for defining their territories.

A shared student room is a central territory (Lang, 1987). Observations show this territory is well defined and strangers do not enter without permission. “Supporting territories are either semi-private or semi-public” (Lang, 1987:150) and in the dorm these are central corridors, kitchens, toilets, baths and praying and TV room. Students do not own them but feel some possession over them and use them for activities. Supporting territories are not well defined in this dorm. Peripheral territories are spaces all can use but over which there is no sense of possession, such as nearby outdoor spaces.

**Territorial connections:** The plan shows central territories (private rooms) are connected to semi-public supporting territories (central corridors). Ideally there should be a semi-private supporting territory between these. In many rooms students have created this with furniture, such as making an entrance space with the wooden lockers in front of the door (Figure 2).

This access hierarchy problem has created security problems, as 92.4% of students have a very low or low sense of possession over the corridors adjacent to their rooms. So, anything (like slippers) left there would quickly be stolen. This also applies to the shared fridges in the corridor. In some cases, residents of the five rooms agree to put their fridge in one of the rooms and all go there to use it. Others have added a lock to their fridge.

However, there is a meaningful relationship between storey number and corridor security. The rate of stealing on the ground floor is much greater than for the three other levels, meaning more trafficked and public corridors are less secure. While 70.6% of students living on the ground floor believe there is a high rate of stealing in corridors, the rates for the first, second and third floor are less at 37.0, 44.4 and 40.0% respectively.

**Sense of ownership:** Sense of ownership of space is a feature of territory (Lang, 1987). A study of student hostels by Khozaei et al (2010) indicates a positive correlation between sense of attachment to space and satisfaction. This analysis shows most students have no sense of ownership of public spaces, with the best place the bath (57.6%), and worst the praying and TV room (95.6%). Relative figures for kitchens and toilets are respectively 91.3% and 70.2%, although distance from public spaces influences this sense of ownership, as increasing distance from kitchen, toilet and bath goes with a reduced sense of ownership. This was not true for the praying and TV room, probably because of the long distance between it and most private rooms. However, satisfaction increases with sense of ownership for all public spaces except baths.
Privacy and interaction: Privacy and interaction are important issues for designers of dorms. Privacy can be seen as person-to-person, person-to-group, group-to-person and a group-to-group social unit relationship (Altman, 1975). An important feature of privacy and interaction is a person’s ability to set boundaries freely and to change and remove these (Schwartz (1968) in Altman (1975)). In this dorm, private rooms should simultaneously provide privacy and interaction for each resident. Observations indicate that private rooms are the first choice of students when they want to be with others, with 85.9% thinking their rooms are excellent or good for this. The situation for students being alone is different as their first choice is then outdoor space (66%), with their room second choice and 63.6% of students thinking their rooms provide an excellent or good situation for privacy.

Table 1. Relationship between quality of privacy/interaction and room satisfaction

<table>
<thead>
<tr>
<th></th>
<th>Quality of your room for your privacy</th>
<th>Subtotal</th>
<th>Quality of your room for your interaction</th>
<th>Subtotal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bad or Middle</td>
<td>Good or excellent</td>
<td></td>
<td>Bad or Middle</td>
</tr>
<tr>
<td>Students who are not satisfied with their rooms</td>
<td>14 = 41.2%</td>
<td>17 = 28.3%</td>
<td>31</td>
<td>7 = 53.8%</td>
</tr>
<tr>
<td>Students who are satisfied with their rooms</td>
<td>20 = 58.8%</td>
<td>43 = 71.7%</td>
<td>63</td>
<td>6 = 46.2%</td>
</tr>
<tr>
<td>subtotal</td>
<td>34</td>
<td>60</td>
<td>94</td>
<td>13</td>
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It seems the rooms cannot provide good privacy and interaction simultaneously, leading students to use other spaces to fulfil their needs or choose territorial behaviour to control their desired level of privacy (Altman, 1975). On the other hand, many students use their friends’ rooms for interaction (80.6%) more than privacy (29.5%), indicating the lack of a gathering place in the dorm. Further analysis shows students who think a space is excellent or good for privacy also say it is excellent or good for interaction. This happens in public areas such as “outdoor spaces”, “city spaces”, “praying and TV room” and “friend’s house” but not in private spaces such as “your room” and “friend’s room”. Furthermore, room satisfaction is higher where there is a perceived increased sense of privacy in the room (Table 1). This supports findings by Amole (2009).

6.2. WHAT STUDENTS WOULD LIKE:

Students were asked about their ideal dorm room with most preferring shared spaces with three (41%) and four (37%) occupants and only 1% requesting a single and 18% a double room. A study by La Roche et al (2010)
on American universities indicates 95.5% of students prefer private bedrooms and 73% prefer private bathrooms. This clearly shows how cultural backgrounds can affect attitudes to and levels of shared space.

7. Conclusion

Though shared space leads to more efficient use of resources, it produces problems especially in terms of territory and private spaces, which can lead to dissatisfaction. Designers should pay more attention to buildings with shared spaces, and what might happen if user numbers increase. Central corridors in dorms can lead to more unwanted traffic and hence more noise, producing dissatisfaction as well as a lack of sense of security. Location of stairs and elevators is important in controlling unwanted traffic through corridors, which need to be as short as possible between these.

A long access route to shared common spaces can lead to their misuse or low use, although low use can lead to greater satisfaction. This is supported by Rodger and Johnson (2005) who found suite-style student housing led to a greater sense of belonging compared with dormitory style buildings. Obviously this comes down to cost but a clustered arrangement around common vertical circulation is more likely to lead to satisfaction with this building type. Figure 3, shows how a few changes in wall configuration, breaking the common facilities into two smaller sets and closing off corridors to room clusters from the stairs, produces quieter and secure corridors, and hence more satisfactory spaces. The number of rooms has not changed (25) but some new rooms are for 6 persons while others cater for 4.

Storage space at personal and group scale plays is important for user satisfaction (Amole, 2009). Private storage space for groups and individuals can lead to more security, satisfaction and efficient use of space. Allocating shared furniture to small groups and locating this in common shared spaces that only belong to that group also improves satisfaction.

Figure 3. Changing a central corridor to a clustered arrangement (new walls hatched)
It seems shared highly occupied dorm rooms are not good for privacy and personal activities that need concentration. Though separate study spaces and a gathering room could help, designing a personal space with a defined territory seems essential. Although dorm rooms with fewer residents (2 or 3) may be more satisfactory, this will cost more. However, in the case study the inherent building flexibility was not used, as changing the wall between rooms makes it possible to create one 4 and one 6 student room that with appropriate furniture (private bunks) could provide a more workable solution as student numbers rose (Figure 4). In any dorm room, however, the boundary between private and public space must be designed carefully.

In the case of common space and furniture there is a limit to the number of users. Exceeding the limit means residents prefer not to use or misuse the space, as for the balcony, praying and TV room and the shared fridges.

More defined territories can lead to a better sense of possession and contribute to more secure spaces. Territory needs to be defined in the internal room arrangement and the room-corridor connection. There needs to be a well-defined boundary between students’ personal and common spaces, and between each shared private room and the semi-public corridor, as students have created with their furniture. A good access hierarchy should proceed from private, semi-private, and semi-public to public space. Absence of any of these four spaces can lead to a sense of insecurity and failure. Breaking long access corridors with no defined territory or sense of possession or adding a semi-private space to room entrances can increase sense of possession and security. For instance, a semi-private space for two rooms could be created by using a sliding door in the entrance space (Figure 4).

Additionally, more use could be made of small spaces if time is considered, as the furnishing plan can be changed from day to night. Iranian architecture is full of multi-use spaces with different furniture for day and night use. Folding furniture is a good idea in shared spaces. The privacy level can also be controlled through a foldable sliding screen (See Figure 5).
This case study shows that though crowded shared spaces have problems, especially with personal space, isolated spaces are also not efficient as they provide a low level of interaction and many people do not prefer these. They also do not match with the concept of sustainability. So, if well designed in terms of privacy, territories and access hierarchy shared space can be more efficient even in buildings with simple organisational forms that are cheap and easy to build. However, what cannot be ignored is that though this trend is well matched with Iranian traditions, the situation may be different for people in other countries, especially western ones, because it seems that the background of residents has a great influence on their ability to cope with living in shared spaces, but this is an area for further research.

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