

DEVELOPMENT OF STUDENT SATISFACTION SURVEY TOOL TO EVALUATE LIVING-LEARNING RESIDENCE HALL

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ABSTRACT: Post-occupancy evaluation (POE) is becoming increasingly significant for continuous improvement in designing and operating any building facilities. As user's satisfaction is a significant indicator (Zimring, 1990), development of a valid and reliable data collection instrument is one of the important actions for a successful POE (Federal Facilities Council, 2001). Today's trend of building residence hall incorporating living-learning programs is increasing to achieve better student success in social and academic life. These new concepts are resulting in the creation of innovative design ideas and new space requirements (e.g., maker's space, innovation lab). To assess the residents' satisfaction about their college housing environment, various authors had focused on various objectives and parameters (Davis & Roizen, 1970; Foubert et.al., 1998; Kaya & Erkip, 2001; Amole, 2005; Hassanain, 2008; Amole, 2009; Dhalan et al., 2009; Khozaei et al., 2010; Najib et al., 2011; and the EBI survey tool). Among all, Najib et al. (2011) in Malaysia focused on physical and social variables combining some parameters mentioned by other authors, but the tool needs more modification to accommodate today's living-learning residence hall design in the United States. The EBI tool mostly focuses on student affair program, not architectural design. The need to develop a new student survey tool is evident, considering the environmental dimensions and architectural determinants. This study followed several methods while developing this survey tool. First, analyzed previously developed tools and scales for student housing to obtain the initial pool of questionnaire items. Second, reviewing several newly constructed projects' Program of Requirements to modify this list. Third, conducted a post-occupancy evaluation in a 648 beds living-learning center considering the initial questionnaire items. Fourth, the instrument was further modified (based on the feedback from the POE). This tool has developed for the undergraduate student residence hall and it carries a great significance to the architects and to the university housing professionals.

KEYWORDS: Post-Occupancy Evaluation, Residence Hall, Student Satisfaction, Survey, Living-Learning

INTRODUCTION

In 1965, Harold C. Riker, one of the pioneering residential educators, explicitly pointed out that residential life can be intentionally designed to enrich students' academic learning and personal development. Since the 1970s, the housing professionals started to develop a more intentional approach to residential education, guided by principles of student intellectual, moral, and psycho-social development theories (e. g., Kohlberg, 1969; Perry, 1970). By the 1990s, the idea of transforming conventional residence halls into living-learning centers captured the interest of institutional leaders (Blimling, 1993). New evidence generated by empirical research (Schroeder, Mable, & Associates, 1994; Terenzini & Pascarella, 1994) highlighted the need to design environments where students can integrate classroom-based and out-of-class learning and can meaningfully interact with peers and faculty. Today's college students demand a different type of housing than has traditionally been offered on university campuses (Argon, 2003; and Blimling, 1993). Many students today who have rarely shared a bedroom or even a bathroom with a family member, seek increased levels of privacy and more amenities than ever before in their residence halls (Kellogg, 2001). In a 1995 qualitative study of housing administrators, the issue of lack of privacy was the most consistent student concern noted by administrators (Banning, McGuire & Stegman, 1995). Considering these demands, in recent years, the living-learning center design has produced a variety of trends; such as, a shift from corridor-style to suite-style housing (Agron, 2003), the building of luxurious residence halls (Macintyre, 2003, p. 110). Overall, student housing has shown itself to be a lucrative and growing business for universities. The exponential growth in the postsecondary population suggests that the need for student housing is likely to increase in coming years.

Post-occupancy evaluation (POE) is becoming increasingly significant for continuous improvement in designing and operating any building facilities. Although POE has not been in the forefront for several decades, in recent years, the interest is reviving and demanding further research endeavors to enhance POE methods. User satisfaction is a significant indicator, which is explained in Zimring's (1990) definition of POE, "the examination of the effectiveness of designed environments for human users." Developing a valid and reliable data collection instrument is one of the important actions for a successful POE (Federal Facilities Council, 2001). There are few student satisfaction survey tools have been developed by many researcher since the 1970s, but those tools are suitable to assess the traditional style residence hall. These tools need further modification to accommodate today's living-learning residence hall designs

in the United States, which incorporates the living-learning programs to achieve student involvement and success in academic and social life. New space requirements and innovative design ideas are evolving to accommodate this living-learning program in the residence halls, such as innovation lab, media room, music practice rooms, classrooms, etc. The need to develop a new student survey tool is evident, considering the environmental dimensions and architectural determinants mentioned above (e.g., social interaction, community involvement, academic success, common spaces utilization rates). This study has focused on developing a tool to survey user's satisfaction for the undergraduate student residence halls.

RESEARCH METHODS

To develop a survey tool, this study has considered several methods. First, it considered a literature search in multiple databases to identify and analyze of previously developed tools and assessment-scales to obtain the initial pool of questionnaire items (those literatures are discussed in the next section). Second, reviewing several newly constructed projects' Program of Requirements to modify this list. Third, a post-occupancy evaluation had conducted in a 648 beds living-learning center considering the initial questionnaire items. The instrument was further modified based on the feedbacks from the POE. The POE has considered a mixed method (quantitative and qualitative research) of data collection. This POE study is Institutional Review Board (IRB) approved. Data had collected using four methods.

1. **Student Satisfaction Survey:** An online survey was conducted using the initial pool of questionnaire inviting all the residents. The response rate was 32%. The survey started on April 26, 2016 and continued till May 31, 2016. The questionnaire was designed with 70 questions, and it took average 9 minutes to answer the questions.
2. **Observation by the Researcher:** Walk-through observation of the facility by the research for 5 times a day for 7 days during spring semester of 2016.
3. **Focus-group Interviews with Stakeholders:** Focus-group interviews with eleven stakeholders group was conducted: Custodial/Facilities Services; Transportation Services; UPD/Security/EHS; Housing Assignments, Conferences, Tours; ResLife CAO; University Energy Service; Res Ed-Hullabaloo Staff; Academic Partners/ASI Staff DRL; Telecom & Computing Info; Dining service; and student leaders of the campus. These stakeholders were involved to develop this project's goal and programming. They were asked mostly three questions: How successful is the project to fulfill the mission statement and goals? What are the positive feedback? What are the areas of improvement? Some meeting was twenty minutes long, and some lasted for more than one hour.
4. **Individual Interviews:** The research interviewed the students and resident assistants (RAs). Face-to-face interviews was conducted with students of each type of room layout (four different types of rooms) and eight RAs out of total sixteen. All the interviews were conducted face-to-face and were audio recorded.

LITERATURE REVIEW

To assess the residence satisfaction about their housing environment, various authors had focused on various objectives and parameters. In 1970, Davis & Roizen suggested 25 items as the architectural determinants of student satisfaction (hominess, privacy, storage space, size, quietness, etc.). In 1998, Foubert et.al. suggested: high-quality facilities, positive roommates' relationship, strong floor, community and quiet study environment; in 2001, Kaya & Erkip propose: room size and crowding; in 2005, Amole (Nigeria) considered: level of crowding and privacy; in 2008, Hassanain (Saudi Arabia) focused: thermal comfort, room layout and furniture; in 2009, Amole again proposed: characteristics of residence halls, rules, fees and attitude of hostels' employee; in the same year, Dhalan et al. recommended: thermal comfort in non-air-conditioned rooms; and in 2010, Khozaei et.al. (Malaysia) suggested: students' attachment to housing. The Association of College Unions International (ACUI) has developed a student assessment tool focusing on student affairs program, the Educational Benchmarking Inc. (EBI) survey tool. This tool is utilizing to assess students' satisfaction, but a very little part of this tool considered architectural design. In 2011, Najib et al. (Malaysia) developed a survey instrument focusing on physical and social variables combining some above-mentioned parameters. Though Najib and his colleague's approach were more comprehensive, but this tool needs more modification to accommodate today's living-learning residence hall design in the United States. Today's trend of building residence hall incorporating living-learning programs is increasing significantly to achieve better success in students' social and academic life. These new concepts are resulting in the creation of innovative design ideas and new space requirements such as maker's space, community learning center, computer lab, music practice room, lecture halls, classrooms, tutoring spaces, etc.

LIVING-LEARNING CENTER DESIGN

As discussed earlier, Universities are designing residence halls with mainly two objectives: to blend academics with living spaces and to foster a sense of community on campus. To compete for students with off-campus housing, today's residence halls are designed with more privacy in accommodation and more vibrant common areas that support academic and social life. According to David J Neuman (2013), student housing needs to provide choices of community on a sliding scale to response student social needs during undergraduate years. "A worthy rule might be that the better the housing as a place, the more scales and kinds of community it can sustain" (Newman, 2013, p.222). The residence halls are most commonly organized as a "social plaid" of hierarchical groupings: sharing room by two students, sharing a floor or wing up to thirty students, and 100 students per ground floor lounge.

Student bed-room is the basic component for living in a residence hall. It is the basic unit planning is the single or double occupancy room. Some authors call it “study-bedroom” because of its multi-purpose use for study, living, and sleeping (Amole, 2005; Hassanain, 2008; Oladiran, 2013). Today, a residence hall design considers several other new emerging factors such as sustainability. Today’s buildings are designing with energy efficient considerations and it also provide education and encouragement to students for adopting sustainable living. Each residence hall project designs with some significant common goals: to support student academic success, to create a sense of community, to improve student social interaction and campus involvement, increase utilization rate, to increase student retention. Therefore, the student satisfaction survey tool needs to address the questions to measure the overall outcome of a residence hall regarding these objectives.

EVALUATION TOOL

As discussed earlier, a student satisfaction survey tool was developed through a research process. This tool has discussed very briefly in the following sections. Each section will briefly introduce the design criteria and evaluation criteria about each area such as bathroom.

Room or Suite: Most study-bedrooms are designed to accommodate two people in a single room, or two to four students in a suite. The standard room size for residence halls is approximately 100 sq ft per bed (Newman, 2013). From the POE, it found that Room ceiling height plays a significant role to overcome the claustrophobia that might come with eight-or-nine foot ceilings, also it allows the beds to be elevated to create enough room for storage below the beds, or overhead storage area. The minimum furnishings for each student are a single bed, a small desk and chair, and a closet or wardrobes to built-in closets. The students want to have enough room to move furnishings around from time to time. To allow that flexibility, sometimes rooms are designed in combination with bunk beds or a system that allows a bed to be stacked over desk. The residence hall personalization programs which allow students to paint and decorate their rooms are significant to achieve student territorial behavior and other positive behaviors (e.g., increase retention rate, lessen damage to public areas, increase cohesiveness among students). In the POE, student mentioned about the significance of having a nice view, enough storage space, furniture quality, and privacy. There are several types of arrangements. According to Neuman (2013), the most common types are:

“Rooms on a path”: Rooms are arranged along a double-loaded corridor with up to 20-24 beds per length of hallway, typically for first and second year students. These group of rooms typically shared a central bathroom and a common lounge. Bathrooms may also be distributed separately as a series of single-fixture rooms shared by the hall.

Two-rooms suites: Two single-occupancy rooms may be adjoined and share a bathroom. The adjoining rooms allow students the option of using one room for sleeping and other as a study or lounge, or use each as a single-occupancy, usually call semi-private suite.

Larger suites: For upper-class, two to four room suites address their desire for greater privacy and choice of roommates. Each suite may have a small living area, a single bathroom, and two double-occupancy rooms or up to four single-occupancy rooms and two bathrooms. Larger combinations may be created by adjoining the living areas of two suites to form a “house,” possibly with a shared kitchen.

Mix Room Styles: The new design trend encourages to mix in suite-style housing with more traditional single and double rooms in each residential college.

Evaluation Criteria of Room/suite	
Size	Interior design (color, finishes, fixtures)
Layout - arrangement of foyer, bath and room(s)	Privacy
Provided amenities	Noise control
Window - size, location, and outside view	Room temperature/thermal comfort
Amount of daylight	Security of property
Quality of artificial lightings	Scope for personalization
Wi-Fi and phone connection	Comfort in sleeping and resting
Furniture quality (aesthetics, durability, comfort, etc.)	Comfort in studying
Number of furniture	Comfort in entertaining friends
Flexibility in arranging furniture	Helps create positive roommate relationship

Amount of storage space	Number of persons sharing the room
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Bathroom: The bathroom must be provided in student housing so that it can serve two adjacent double bedrooms or a common bathroom can serve a set of four or five bedrooms. The changing dynamics of the residence hall bathroom is to provide safe and equitable facilities for transgender and nongender-identified students which reflect institutional values of inclusion and community. More than 200 U.S. colleges and universities now offer some form of gender-neutral, or all-gender, bathrooms and/or housing on campus. From the POE, there are several criteria have evolved:

Evaluation Criteria of Bathroom	
Size of bathroom	Number of people sharing the bathroom
Layout (arrangement of sink, shower & toilet)	Shelves for toiletries
Fixtures and finishes	Heat lamps
Ventilation	Privacy
Lighting	Door signage system helps to understand occupancy
Temperature/thermal comfort	Positive communication with your floor mates in the bathroom [if common bathroom]
Having enough “dry floor” space for dressing/undressing	

Common Areas: Common areas in residential hall plays a vital role in creating a better community and becoming a place for students to release their stress with peers. Today, residential housing projects are offering a variety of common areas: lounges, seminar rooms, game rooms, and other socially oriented amenities, such as nooks with seating arrangements. Advances in technology are energizing the design of common areas in residence halls. Mobile computing and Wi-Fi connectivity make every space a potential study nook therefore the study areas no longer require lots of desks or tables, comfortable sofas and chairs are taking place. Some provides innovative common areas to enrich learning experiences. Classrooms and multipurpose rooms with movable furniture and partitions are desirable features in some residence halls for academic support. According to Neuman (2013), the essential planning principal for shared spaces (facilities) is hierarchy: “that is, spaces for special activities are located according to their function along the path from the building entry to the individual rooms or suites. The most unique facilities are placed at or near the entry to the building or at the center of the complex. The more repeated facilities are closer to the rooms” (p.226).

Floor Common Area: As Najib and his colleagues (2011) mentioned, after room and bathroom, the floor common areas are important. The basic kit of the residence hall includes multi-use lounges for study and social contact. Each cluster of bed-rooms will benefit from at least 10-15 sq ft of lounge area per bed – particularly where rooms are mainly double occupancy. Larger lounges provide more active space; smaller ones offer quite retreats for late-night work. Such spaces can also function as the hinge between floors or corridor suites. Smaller workrooms can be distributed as hideaways or clustered to bring together. Laundry and kitchen facilities also promote community, linking separate suites and groups by bringing students upstairs or down and inviting interaction. As with other factors, entering freshman may benefit from larger facilities shared by more neighbors, and returning undergraduates may prefer the greater privacy and convenience of smaller, more distributed facilities. Shared kitchen is typically equipped like residential kitchens, with additional care for durable finishes. Laundries serving larger numbers of students are treated and equipped like commercial laundromats (and may be operated by commercial firms), but benefit from additional space for seating, television viewing, and conversation (Neuman, 2013). Laundry rooms have become a popular requirement in student housing and should be large enough to accommodate enough washer and dryer, and also recreational facilities for students (Najib et al., 2011). Hallways are possibly the most social spaces in any residence scheme and should be laid out with some variation in width to allow places for spontaneous conversation. At intervals, or at the ends, natural light is extremely valuable, even as borrowed light from lounge/study rooms and stairways. Some articulation at entries to bathrooms and even student rooms allows for an important sense of threshold (Neuman, 2013). From the POE, there are several factors revealed, such as location of Resident Assistant (RA) room, trash room, distance from room to circulation.

Evaluation Criteria of Floor Lounge Area	
Location	Interior design (color, finishes, fixtures)
Size	Privacy
Layout and furniture arrangement	Noise control

Provided amenities	Room temperature/thermal comfort
Window view	Wi-Fi and cell phone connection
Amount of daylight	Comfort in Group Study
Quality of artificial lightings	Comfort in Individual Study
Furniture quality (aesthetics, durability, comfort, etc.)	Comfort in socializing/gathering
Number of furniture	Comfort in relaxing
Flexibility in arranging furniture	Helps to organize social event
Comfort in cooking at the kitchenette	Helps create floor community among students
Ventilation in kitchen	
Evaluation Criteria of Wing Study Area	
Location	Interior design (color, finishes, fixtures)
Size	Privacy
Layout and furniture arrangement	Noise control
Provided amenities	Room temperature/thermal comfort
Amount of daylight	Wi-Fi and cell phone connection
Quality of artificial lightings	Interior design (furniture, color, finishes, fixtures)
Number of furniture	Comfort in Group Study
Furniture quality -flexibility in arranging furniture	Comfort in individual study

Ground Floor Common Areas: As mentioned by Neuman (2013), the most unique facilities are placed at or near the entry to the building or at the center of the complex. In today's living learning residence hall, the ground floor work as a community village which accommodates all the unique social and academic areas, such as game room, multi-purpose classroom. Some residence halls are incorporating some retail stores and restaurants. The case-study hall of this study has created the ground with various social and academic amenities and provided access to other students along with the residents. The unique areas are: a Starbucks coffee shop, a convenience store, a music practice room, a media room, a multi-purpose recreational room or game room, a multipurpose academic room, called Community Learning Center (CLC), which employs an open office design concept. The space has individual and group study areas and is equipped with high-end computers with access to special engineering programs and other expensive software that most students can't afford. Lobby area should have an informal and intimate atmosphere so that students feel comfortable entertaining parents or guests (Najib et al., 2011; Bland and Schoenauer, 1966; Ibrahim et al., 2010). The lobby may also be used as a reading area and social activities. In addition to exit stairs, open stairs linking lounges can enhance social life. At least one stair and/or elevator should provide additional width for moving furniture and for emergency/disabled access (Neuman, 2013).

Front Lobby	
Easily accessible and welcoming entrance	Community art to represent college identity
Location	Branding
Size and number of seating arrangements	Provided amenities
Layout, arrangement, Openness	Arrangement
Interior Design (attractive appearance and	Meeting and entertaining guests
Ensure security or filtering others	Aesthetic/ appearance
Convenient location of the front desk	Public accessible restroom
Scope for entertainment (vending machine or access to retails or TV-lounge, etc.)	

*Evaluation Criteria of Ground floor community areas	
Main lobby and reception area	Game room
Media room	Mail boxes and parcel area
Multipurpose room	Outdoor gathering spaces
Specialty rooms	
* Each space or area has its unique requirement for evaluation. But there are some common criteria for each space. Due to space limitations, only the following three have presented.	

Innovation Centre /Makers Space	
Size	Access to daylight and views
Provided amenities	Number of maker board, roller shades,
Number of furniture and equipment	Media centre/modelling/Fabrication
Interior design (color, finishes, etc.)	Number of working desk
Acoustic design (noise control in both ways)	Visual connection with other spaces
Technology	Fabrication space
Lighting	Card access doors

Retail centre (Convenience store/ Coffee shop)	Music room
Location and access	Size
Acoustic/ Sound attenuation	Number of equipment and technology
Arrangement	Visual connection
Provided amenities	Comfort in practice
Easy accessibility	Comfort in group practice
Price of the food/item	Acoustic/ Sound attenuation
List of available Items	Provided amenities

Site planning and building Entrance: Site planning and building accessibility is a significant one. From the literature review, stakeholders meeting and students feedback, there are some points found significant: pedestrian, bicycle, and vehicular access, “moving day” access with temporary vehicular use of main pedestrian paths; bicycle parking on most campuses is a great challenge, accommodating large numbers of bikes as close as possible to building entrances; security establishes clear visibility along paths into and out of the buildings and site; organizes residents’ windows to overlook public areas; activities ground-floor building edges with views into and out of public rooms; placement of dining and other shared social activities to “capture the energy” campus or to energize the center of a large complex.

Accessibility and parking	
Number of parking	Easily accessible entrance
Bicycle parking area (number and location)	Convenience to move-in and move-out
Auto Parking area	Safety and security
Site and Context	Exterior appearance and aesthetics

Outcome Measures: It is significant to measure the student self-reported evaluation about their academic success, social involvement, space utilization, sense of community, and retention. Questions related to measure these outcomes are as follows:

Academic Success									
This hall provides environment and opportunity to feel like home.									
This hall provides enough facilities & amenities to create a living-learning community.									
How satisfied are you with your GPA? <input type="checkbox"/> Doesn't meet expectation <input type="checkbox"/> meets expectations <input type="checkbox"/> exceeds expectations									
How important is it to you to feel supported academically by Residence Life? Please rate below.									
Less	1	2	3	4	5	6	7	Very	

Social Success	
Students of this hall have a sense of community.	
Students of this hall socially interact with each other.	
Students are frequently participating in the social activities (play game, watch TV, etc.).	
How much do you socially interact with other students from the same wing? (write number)	
<input type="checkbox"/> You know name & talked once with _____ person	<input type="checkbox"/> You say "Hi" frequently of _____person
<input type="checkbox"/> You hangout frequently with _____ person	<input type="checkbox"/> You study together with _____person

Utilization Rate					
Please answer the following questions based on your activity:	Never	Once a month	Once a week	2 - 4 times a week	Almost daily
How often do you use the community lounge in your floor?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How often do you use the study room in your floor?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How often do you use the main floor community Amenities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How frequent do you spend time with other students from this hall?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How frequent do you group study with other students in this hall?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How often do you invite other students for study or socialization?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How often do you group-study in the lounge/study room?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Overall Success (How satisfy with the following statement)
Overall functions and amenities of this hall supports students' personal, social & academic success.

Please Provide your comments:
Why did you choose this Hall when applying for on-campus housing? [Question about retention]
Are you considering living in this residence hall next year? Why or why not? [Question about retention]
Please provide any other opinion or suggestions.

EXPECTED OUTCOMES

The study has developed a satisfaction survey tool for student housing. It provides a standardized tool for the user's evaluation about the physical environment, functional or social environment, and utilization rate. This tool articulate student opinions about their physical setting in three levels. *Fixed* or *structural features* include those which are permanent architectural elements, such as building layout or location of window. *Semi-fixed features* include less

permanent architectural elements (presence or absence of handrails, or finish materials). *Non-fixed features* include the presence of wall hangings, activity supplies, and others. The anticipated outcomes of this tool are:

- The users' satisfaction rate of this newly designed residence hall will provide information to develop a design guideline for architects and interior designer for applying design skills more effectively.
- The findings will improve commissioning process by defining students' requirements about their living learning environments.
- It will improve the management procedures by providing knowledge about operation and refurbishment.
- It also carries values in future research on students housing environments.

SIGNIFICANCE

This research was evaluating a student housing design to develop better guidelines for architects and to provide feedback about the existing condition of the housing to the administrator for further improvement. These will benefit the greater audience: students, professional architect, and residence hall administrator. It also carries significance for future research for these disciplines. So, as a member of broad society the students will be benefited.

Architectural Practice. This tool carries the same significance as any post occupancy evaluation tool does in architectural practice; which is defined by the Royal Institute of British Architects Research Steering Group as "a systematic study of buildings in use to provide architects with information about the performance of their designs and building owners and users with guidelines to achieve the best out of what they already have" (RIBA, 1991). More anthropologically it was defined by Friedmann (1978) as "an appraisal of the degree to which a designed setting satisfies and supports explicit and implicitly human needs and values of those for whom a building is designed". This tool can be used as evidence of the effectiveness or the weakness of design decisions in relation to student with their living-learning environments. So, the plausible benefits of this tool also include: applying design skills more effectively; improving the building commissioning process; improving user requirements; providing knowledge for design guides; and targeting of refurbishment (Whyte & Gann, 2001). The study findings contribute to evidence-based design (EBD) research and practice (Diaz Moore & Geboy, 2010). The evaluation criteria can be used to determine project goals and the tool can be used to measure the baseline performance and the post occupancy performance results.

Residence-life profession. As mentioned earlier, this tool assesses the living-learning environment in global context: physical setting, social environment, utilization rate, self-reported outcome such as GPA, or academic success. This tool will provide valuable information to support the goal of continuous improvement of any student housing facility (Zimmerman & Martin, 2001) and also be utilized for improving organizational policy and facility management (Green and Moss, 1998; and Whyte & Gann, 2001).

CONCLUSION

This tool has developed as an initial effort. The study has limitations which need further research. This study needs to consider experts' opinion (architects and housing professionals) and further field testing to validate and modify these list of evaluation criteria. Also, it needs further quantification of each criteria to support these findings and to determine the weightage of each criteria. Although, this tool has developed to use in undergraduate student housing so it is not generalizable for other types of student housing, it can be work as opening template to develop others.

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