Preferences in university residences:
A confirmatory study

Fernando Oliveira Tavares*
ISCET - Higher Institute of Business and Tourism
Rua de Cedofeita, 285 | 4050-180 Porto | Portugal
http://orcid.org/0000-0002-9672-8770
ftavares@iscet.pt

Luís Dias Pacheco
Department of Economics and Management, Oporto Global University
Rua Dr. António Bernardino de Almeida, 541-619 4200 – 072 Porto, Portugal
http://orcid.org/0000-0002-9066-6441
luisp@upt.pt

Luís Gomes Almeida
PhD in Corporate Strategic and Economic Analysis at the University of Vigo
Master in Economics at the University of Aveiro
Researcher at RGEA Group, University of Vigo.
Campus Universitario | C.P. 36.310 Vigo (Pontevedra) | España
https://orcid.org/0000-0003-2086-559X
lgomes@uvigo.es

Corresponding author*

Abstract

The main objective of this paper is to identify and confirm the characteristics of university residences most valued by the students. The study was carried out in the university residences of a Portuguese public university, for a sample of 342 students. Confirmatory factorial analysis reveals five determining factors in student preferences: the unique experience and experience provided, the interior and location amenities, academic performance, environmental awareness and safety. Fundamentally, it is observed that students prefer residences in the vicinities of the department where they study and other academic spaces and also close to the local markets.

Keywords: University residences, higher education, student; academic living, university identity.

Introduction

The entrance and continuation of studies in higher education signifies a new phase in the life of a student. Globally, university residences are built with the aim to allow and support students to attend higher education. Otherwise, displaced students would find it very hard to attend classes and continue with their studies. The present work aims to contribute to deepen the scientific knowledge about the hospitality of the university residences, allowing for the improvement of the service provided by the social services from the higher education institutions and also the accommodation conditions provided to the residents, allowing a greater satisfaction which can hopefully then translate into higher academic performance.

The objective of the paper is thus to study and confirm the preference variables and the determinants of those preferences by the students living at a university residence. In order to attain the defined objectives, the paper is divided into five sections. After this introduction, the paper presents a review of the literature on the subject that was the basis for the construction of a questionnaire survey. In the following section it is presented the methodology used to analyze the data collected by the survey. The fourth section presents the results, beginning by

the descriptive statistics of the variables under analysis, followed by the confirmatory factorial analysis. The final section presents the main conclusions.

Literature review

In their studies about university residences Garrido & Mercuri (2013) and Delabrida (2014) researched, through questionnaires, the living conditions in university residences, studying the main reasons that generate conflicts and pleasant moments of leisure at the same residences. According to those authors, students living at university residences attach importance to some amenities, such as the vicinity of the premises, internet access and individual safe deposit boxes to store their most precious items. Other aspects to consider regarding amenities are the adequate lighting of public and private spaces and the existence of laundries and specific appliances. It should be noted that some of these aspects transform a student's room from a mere sleeping place into a more appropriate and private study center (Khozaei, Hassan, Ramayah, 2011a, b).

Regarding the physical space, Khozaei, Ramayah & Hassan (2012) defined six preponderant factors in the university residence: facilities, amenities, convenience of the room, location, social contact allowed by the physical space and safety. According to Iftikhar and Ajmal (2015), university residences present some positive aspects, being highlighted the fact that students become more responsible, learn to take better care of them, are capable to better organize their study, have a tendency towards greater ease of interpersonal communication, improved self-confidence, self-esteem and independence. Studies about university residences refer to the notion that students prefer the residences' upper floors and that the size of the room may influence the satisfaction level, as well as the corridors and dormitories dimension.

Parece et al. (2013) report that cleanliness and maintenance factors have a strong impact on the residents' satisfaction. Although there are several studies about student satisfaction whether living inside or outside the campus, there is no unanimity about the findings.
The results of the literature review are summarized in Tables 1 and 2, which present some studies that refer to positive and negative aspects of university residences.

A new wave of studies examines environmental attitudes and the search for solutions for sustainable consumption. Conservation, sustainability and rates of human consumption are associated to behaviors with significant environmental impact. Finally, it can be verified that most of the studies are based on student surveys with a quantitative analysis (Delabrida, 2014; Garrido, 2015, Iftikhar & Ajmal, 2015).

Table 1: Positive aspects of the university residences

Description	Country	Time period/date	Methodology	Authors
Academic performance	USA	2007	Survey	Jacobs & Archie (2008)
	Brazil	2014	Structured interview	Garrido (2015)
Ease of adaptation, higher interaction	USA	2010	Survey	Rocconi (2011)
	Brazil	2014	Survey	Delabrida (2014)
	USA	2005	Survey	Dusselier et al. (2005)
	Brazil	2004	Ethnographic analysis	Berlatto & Sallas (2008)
Increase in tolerance	Brazil	2003	Qualitative analysis	Laranjo & Soares (2006)
	Brazil	2010	Qualitative analysis/ Structured interview	Fior, Mercuri & Almeida (2011)

Source: Authors own elaboration

Table 2: Negative aspects of the university residences

Description	Country	Time period/date	Methodology	Authors
Lack of privacy	Canada	2005	Survey	Galambos, Howard & Maggs (2011)
Prices	Malaysia	2010	Survey	Khozaei, Ramayah & Hassan (2012)
Quality of the facilities	Brazil	2013	Literature review	Garrido & Mercuri (2013)
Problems with food	Brazil	2013	Literature review	Garrido & Mercuri (2013)
Distance/ situation	China	2006	Survey	Wang & Li (2006)
Security/safety	Malaysia	2010	Survey	Khozaei, Ramayah & Hassan (2012)

Source: Authors own elaboration

Methodology

After reviewing the literature on the subject an exploratory survey was elaborated upon in order to attain the objectives of the paper. In the present study, the reserachers resort to Confirmatory Factor Analysis to evaluate the measurement model (Marôco, 2010; Tavares & Fraiz Brea, 2018). For this purpose, the software SPSS AMOS 21.0 was used.

The measurement model, which establishes the relations that connect constructs to indicators and constructs with each other, was estimated through the already mentioned software and using the estimation method of Maximum Verisimilitude, a robust method even when there is a violation of the normality of data (Hair Jr. et al., 2010).

For the model's adequation evaluation, the researchers used a set of adjustment indices, choosing the ones which are the most referred on literature (Marôco, 2010), namely, the test of relative Chi-Squared (χ^2/gl), the Goodness of Fit Index (GFI), the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI) and the Root Mean Square Error of Approximation (RMSEA). About the cutting points of these indices, we consider a good model adjustment when: (1) the value of χ^2/gl is less than 2 or 3; (2) the values of CFI, TLI and GFI are greater than 0,90 (for GFI are considered as acceptable values greater than 0,80, according to Hu & Bentler (1999) and Brown (2006); (3) the RMSEA value is less than 0,10 (Marôco, 2010).

The evaluation of convergent validity has been followed (if the studied construct is positively and significantly correlated to other constructs which are theoretically parallel and the items which compose it present positive and high correlations), as well as discriminant validity (if the items which reflect a construct are not correlated with other constructs) (Marôco, 2010). In the present study, in order to evaluate the convergent validity, we follow the recommendation of Fornell & Larcker (1981), who propose its measurement through Average Variance Extracted (AVE), factorial loads and Composite Reliability (CR). According to Hair Jr. et al. (2010), the factorial load must be greater or equal to 0,50, whereas an acceptable value for CR is of at least 0,70, and for AVE of 0,50.

$$\widehat{CR}_J = \frac{\left(\sum_{i=1}^{k} \lambda_{ij}\right)^2}{\left(\sum_{i=1}^{k} \lambda_{ij}\right)^2 + \sum_{i=1}^{k} \varepsilon_{ij}}$$

$$\widehat{AVE} = \frac{\sum_{i=1}^{k} \lambda_{ij}^2}{\sum_{i=1}^{k} \lambda_{ij}^2 + \sum_{i=1}^{k} \varepsilon_{ij}}$$

Where:
$\sum_{i=1}^{k} \lambda_{ij}^2$ represents the standardized coefficients;
$\sum_{i=1}^{k} \varepsilon_{ij}$ represents the measurement errors.

Discriminant validity was evaluated by the method which was recommended by Fornell & Larcker (1981), which primarily consists on the comparison between the Average Variance Extracted (AVE) of the construct and the square of correlation coefficients with the remaining constructs, wherein AVE must present a greater value.

Results
Descriptive statistics

The study sample consisted of 342 students from a Portuguese public university, obtained from a total population of 1000 residents enrolled in undergraduate, master's and doctoral courses, 31,9% male and 68,1% female. As for religion, 71,1% are Christians, 0,6% are Buddhists and 28,4% are atheists or with other unspecified religions. Regarding nationality, 91,2% are Portuguese and 8,8% are foreigners, being those in general from Brazil and other Portuguese-speaking countries. In relation to the family residence of students, 81% are from mainland Portugal, coming from municipalities located on average at 97 km from the University.

Regarding marital status, 98,3% are single, 0,9% are married, 0,3% are separated / divorced, 0,3% are widowers and 0,3% live with someone. The average age is 21 years ($\bar{x} = 21,10$; $\sigma = 3,526$) being the minimum age of 17 years and the maximum of 43 years.

In terms of household size, households with three individuals (35,7%), are followed by four individuals per household (34,5%), five persons per household (12,6%), two persons per household (9,1%) and one person per household (5,8%). Only 2,7% of the individuals come from households with six or more persons. With regard to household income, 64,9% has a gross annual income of less than € 10.000, the most outstanding figure.

On the subject of the number of enrollments they have at the university, 30,7% of the students have one enrollment, 23,7% have two enrollments, 17,3% have three enrollments, 9,1% four enrollments, 14,9% five enrollments, 2,9% six enrollments and only 1,5% with seven enrollments. From the survey responses we can see that 67,5% of individuals are living in residences located in the university campus whereas 32,5% live outside the campus.

Regarding the preferred floor for living at the university residence, 14,6% of the individuals prefer the ground floor, 33,3% prefer the 1st floor, 26,9% prefer the 2nd floor, 8,2% prefer a floor above the 2nd floor and 17,0% prefer the top floor. Concerning the question in which floor they currently reside, 11,7% of individuals reside on the ground floor, 31,3% on the first floor, 32,7% on the 2nd floor, 21,1% above the 2nd floor and 3,2% reside on the top floor.

Concerning the level of education attended, 69,9% of the students are enrolled in a undergraduate degree, 29,8% are in a master's degree and only 0,3% attend a doctorate.
The survey also asked since when they had been living at the university residence: 10,5% of the students were living for less than three months at the university residence, 4,4% between three to six months, 26,3% between six to twelve months, 15,5% between one and two years, 21,3% between two and three years and 21,9% for more than three years.

Regarding prices, 83,4% of the students are satisfied or very satisfied with the prices practiced by the university residence. In general, about 70% of the students are satisfied or very satisfied with the university residence.

In terms of the facilities and amenities provided at university residences, we can observe that some of the most important issues are: hot water in bathrooms, free internet access, the kitchen availability, a stove with oven and the proximity of a supermarket. As for issues with lower averages and therefore less important for students living at university residences, there

is the need of an indoor pool, a elevator, vending machines, a safe in the room and the existence of an online system to know if the washing machines are occupied.

The attributes most valued by the students living at the residence are the cleaning of the common areas, the illumination of the common areas, the good natural and artificial light, the size of the room and the good appearance of the common areas. Concerning the less important attributes / characteristics we have the short corridors, modern and stylish furniture and the beauty of the exterior and building facade.

Regarding the preferences about the different furniture and appliances available inside the university residences' rooms, it can be noted that students prefer to have a large closet in the room, to live in a building with separated areas to sleep, eat and study and to have a space under the bed which can be used to store objects. The less important items are the existence in the room of carpets, cable television and air conditioning.

Apropos the location preferences of the university residence, the results indicate that students prefer a residence near the university or department where they study, close to the different academic areas and near the local markets. The students give less importance to having housing in the neighborhood and to the fact that it is located near the university sports facilities.

To gain the social contacts made possible by living at a university residence students prefer to have a large area for students' meetings and the possibility for siblings or others to share the same room. Concerning the items considered less important by the students, there is the possibility to locate students with the highest graduation on the ground floor; to have differentiating colors in each floor and the ability to locate students from each faculty on each floor.

From the students living at the university residence who answered to the survey, 9,1% have an individual bathroom and 90,9% have a collective bathroom. Regarding the question which asked what should be the maximum number of persons per bathroom, 4,4% refer that it should be one person, 62,6% think that there should be two persons, 24,0% three persons, 7,6% four persons and only 1,5% express the opinion that there should be at least five persons per bathroom.

Regarding the students living experience, the results evidence that students become more independent, students learn to organize their personal finances and gain a greater openness to diversity. Concerning the issues related to the university residence safety, the most important items are the nice and friendly staff, night light and safe doors and windows. The items that the students consider less important are: room doors with video intercom, access card required to enter the room and the lack of security on weekends.

The results presented are in accordance with the literature review, namely Garrido & Mercuri (2013), Delabrida (2014), Khozaei, Ramayah & Hassan (2012), Khozaei, Hassan & Ramayah (2011a, b).

Confirmatory factorial analysis

The measurement model which was initially used presented itself as unsatisfactory, since some adjustment indices revealed an unsatisfactory adjustment: $\chi2/gl$ = 3,9200; GFI = 0,762; CFI = 0,861; TLI = 0,848; and RMSEA = 0,080. All items present high factorial loads, greater than 0,50 (Marôco, 2010).

Using modification indices, it has been possible to observe high values for the covariance between the errors associated to the variables VEUP4 and VEUP11; VEUP6 and VEUP9, all of them items belonging to the living and unique experience factors, to the variables AIL5 and AIL7 from the interior amenities and location factor and variables S2 and S3 from the safety

5

factor (the different variables are presented in Table 2). Taking these results into account, and with the objective of improving the model, it has been re-specified, correlating the errors of the referred variable pairs, which were inserted in the same factor.

After the model's re-specification, we obtained good results for all the adjustment indices (χ^2/gl = 2,336, GFI = 0,838, CFI = 0,921, TLI = 0,913 and RMSEA = 0,063).

Figure 1 presents the re-specified model.

Figure 1 – Confirmatory factor structure of the students living in university residences' preferences
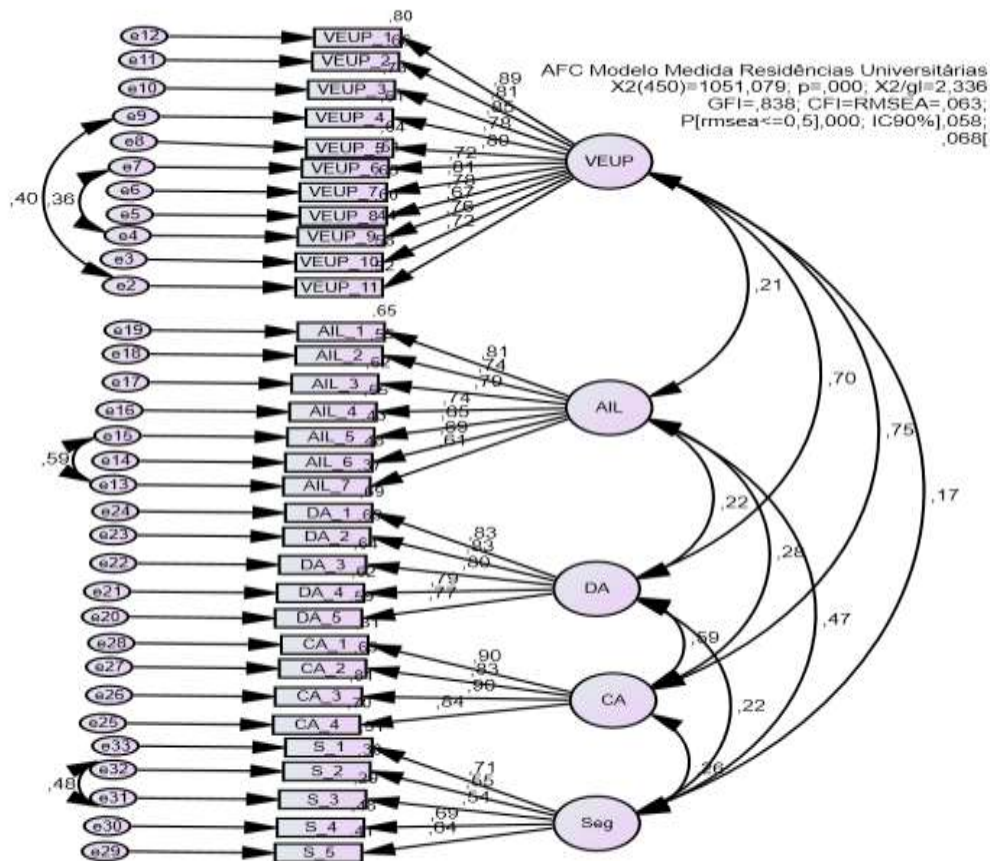
Source: AMOS output

Table 2 – CFA resulting from students living in university residences' preferences

Associated variables	Code	
Students learn to take care of themselves and become closer to the ..	VEUP1	
Improves communication skills with the others	VEUP2	
Students learn to avoid undesirable attitudes from the others	VEUP3	Unique living experience provided
Students become mode independent	VEUP4	
Students learn to tolerate and to establish commitments with the ..	VEUP5	
Improves the development of a sense of community	VEUP6	

6

Improves problem solving capabilities	VEUP7	
Students become more responsible	VEUP8	
Greater openness to diversity	VEUP9	
Increases students' self confidence and self esteem	VEUP10	
Students learn to organize their personal finances	VEUP11	
Modern and attractive furniture in the social room	AIL1	
Beauty of the building exterior and facade	AIL2	
Beauty and coziness of the interiors	AIL3	
Modern and stylish furniture	AIL4	Interior amenities and location
Agreeable scenic view	AIL5	
New or recently refurbished building	AIL6	
Agreeable views from the room window	AIL7	
Better academic performance	DA1	
Improves persistence at study	DA2	Academic performance
Improves academic success rates	DA3	
Higher educational aspirations	DA4	
Greater satisfaction with the experience at the university	DA5	
Human consumption rates	CA1	
Students start to give importance to a environmental friendly behavior	CA2	Environmental awareness
Develops a conservation and sustainability awareness	CA3	
Reduction in energy consumption	CA4	
24 hour security	S1	
Access card required to enter the residence	S2	
Access card required to enter the room	S3	Safety
Doorman	S4	
CCTV	S5	

Source: Authors own elaboration

Convergent validity and discriminant validity

As it can be observed on Table 3, the CR values are greater than 0,70, and the obtained values for the Average Variance Extracted (AVE) (in the diagonal of Table 3) are greater than 0,50, with the exception of construct S (safety). Yet, Fornell & Larcker (1981) refer that a superior limit under 0,40 for AVE is acceptable since CR is above 0,60. As can be observed in Table 2, the CR values are above 0,70 and the AVE values (in the diagonal of Table 3) are above 0,40, verifying the scale convergent validity.

Discriminant validity was tested by the Fornell & Larcker (1981) criteria, consisting in the comparison between AVE of the construct with the square of the correlation coefficients with the other constructs (other values in Table 3), being that AVE should present higher values.

Table 3 - Composite Reliability (CR), Average Extracted Variance (AVE) and the square of the correlation between constructs

	CR	VEUP	AIL	DA	CA	S
VEUP	0,946	**0,614**				
AIL	0,877	0,045	**0,545**			
DA	0,902	0,491	0,049	**0,648**		
CA	0,924	0,560	0,078	0,352	**0,753**	
S	0,768	0,171	0,472	0,224	0,264	**0,401**

Source: Authors own elaboration

Regarding Factor 1, as can be seen in Table 2, the observation of the variables that contribute to explain this factor allow us to conclude that we are dealing with aspects related to the experience of living in a university residence. Thus, this factor is explained by the unique experiences enjoyed by those living at the university residence, with the items presenting an excellent consistency. In Factor 2, we observe the variables related to the interior amenities and the location of the university residence. This factor is explained by people who enjoy staying in clean and hygienic places and this factor presents a great consistency. In Factor 3, the variables that contribute to explain this factor allow us to conclude that we are dealing with questions related to the students' academic performance. Therefore, this factor is explained by the interrelationship between the different variables that contribute to academic performance and presents excellent consistency. Contributing to Factor 4 there is a set of secondary variables related to the environmental conscience that is instilled in the students. This factor also presents excellent consistency. The variables contributing to Factor 5 are related to the university residences' safety, namely the issues associated with physical security. These are variables that complement each other and improve safety, being this factor of good consistency.

Conclusions

From the present survey we can conclude that the majority of the households of the students living at the University residences (64,9%) have a gross annual income of less than € 10.000. The University owns the majority of the residences inside the university campus and generally students are satisfied or very satisfied with the residences (70,0%) and with the prices they pay.

At the level of facilities and amenities of university residences, students give relevance to the availability of hot water, free internet access, a kitchen, a stove with oven and proximity to a supermarket. As regards the attributes of university residences, students value the cleanliness, good lighting (natural and artificial), the size of the room and the general appearance of the common areas.

At the furniture level, students prefer to have a large bedroom closet and a building with separate areas for sleep, eat and study. Students also prefer a residence near the university and its academic areas and near the local markets.
About students' experiences and socialization in university residences, the students' opinion is that living there allows them to become more independent, learn to better organize their personal finances and present a greater openness to diversity.

Regarding issues related to the security and safety of the university residence, students prefer a nice and friendly residence staff, the existence of night light and safe doors and windows. The students complained mainly about the lack of refrigerators or mini-refrigerators, the lack of heating and the noise made by colleagues in the residences.

The confirmatory factorial analysis presents five factors that are important for the characterization of the students' preferences living in university residences. These factors are the unique experience of living at a university residence, other important factors for the students are the interior amenities and location of the residence, the better academic performance and the development of an environmental awareness. Finally, the last major factor for the users of university residences is safety.

These results can thus aid in the decisions taken by those with responsibilities at the university Social Services, regarding the management of the residences, in order to increase the benefits perceived by the users and allow a cost-benefit analysis. We can then conclude that the objectives initially proposed with the present study were achieved, since it were identified the

main variables and determinants of students' preferences in the university residences of a Portuguese public university.

References

Berlatto, F. & Sallas, A. L. F. (2008). Um lar em terra estranha: espaço e sociabilidade em uma casa de estudantes feminina. *Revista Chilena de Antropologia Visual*, *2*(2),48-69.

Brown, T. (2006). Confirmatory factor analysis for applied research. The Guilford Press. New York: The Guilford Press. https://doi.org/10.1198/tas.2008.s98

Delabrida, Z. N. C. (2014). Variáveis individuais, sociais e do ambiente físico em residências universitárias. *Psico*, *45*(3), 10-20.

Dusselier, L., Dunn, B., Wang, Y., Shelley, M. C. & Whalen, D. F. (2005). Personal, health, academic, and environmental predictors of stress for residence hall students. *Journal of American College Health*, *54*(1), 15-24.

Fior, C. A., Mercuri, E. & Almeida, L. D. S. (2011). Escala de interação com pares: construção e evidências de validade para estudantes do ensino superior. *Psico-USF*, *16*(1997), 11-21.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50. https://doi.org/10.2307/3151312

Galambos, N. L., Howard, A. L. & Maggs, J. L. (2011). Rise and fall of sleep quantity and quality with student experiences across the first year of university. *Journal of Research on Adolescence*, *21*(2), 342-349.

Garrido, E. N. & Mercuri, E. (2013). A moradia estudantil universitária como tema na produção científica nacional. *Revista Semestral da Associação Brasileira de Psicologia Escolar e Educacional*, *17*(1), 87-95.

Garrido, E. N. (2015). Experience of living in a college residence hall: Impact on its residents. *Psicologia: Ciência e Profissão*, *35*(3), 726-739.

Hair Jr., J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis*. (7th ed.). Upper Saddle River: Prentice Hall.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling: *A Multidisciplinary Journal*, 6(1), 1–55. https://doi.org/10.1080/10705519909540118

Iftikhar, A. & Ajmal, A. (2015). A Qualitative Study Investigating the Impact of Hostel Life. *International Journal of Emergency Mental Health and Human Resilience*, *17*(2), 511-515.

Jacobs, J. & Archie, T. (2008). Investigating sense of community in first-year college students. *The Journal of Experiential Education*, *30*(3), 282-285.

Khozaei, F., Hassan, A. S. & Ramayah, T. (2011a). The students' degree of preference for residence hall facilities and amenities, study of a developing country. *African Journal of Business Management*, *5*(17), 7335-7341.

Khozaei, F., Hassan, A. S. & Ramayah, T. (2011b). Development and validation of the student accommodation preferences instrument (SAPI). *Journal of Building Appraisal*, *6*(3), 299-313.

Khozaei, F., Ramayah, T. & Hassan, A. S. (2012). A Shorter Version of Student Accommodation Preferences Index (SAPI). *American Transactions on Engineering & Applied Sciences*, *1*(3), 195-211.

Laranjo, T. H. M. & Soares, C. B. (2006). Moradia universitária: processos de socialização e consumo de drogas. *Revista de Saúde Pública*, *40*(6), 1027-1034.

Marôco, J. (2010). *Análise de Equações Estruturais: Fundamentos teóricos, Software & Aplicações.* Pêro Pinheiro: ReportNumber- abril de 2014.

Parece, T., Younos, T., Grossman, L. S. & Geller, E. S. (2013). A study of environmentally relevant behavior in university residence halls. *International Journal of Sustainability in Higher Education*, *14*(4), 466-481.

Rocconi, L. M. (2011). The impact of learning communities on first year students' growth and development in college. *Research in Higher Education*, *52*(2), 178-193.

Tavares, F.O. & Fraiz Brea, J. A. (2018). Confirmatory analysis of the preference in Boutique Hotels in the city of Oporto, Portugal. *African Journal of Hospitality, Tourism and Leisure*, 7(4), 1-11.

Wang, D. & Li, S. (2006). Socio-economic differentials and stated housing preferences in Guangzhou, China. *Habitat International*, *30*, 305–326.