

A Study on the Relationship between Physical Education Environment and Recommendation Intention and the Moderating Effect of University Image

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Abstract: Universities providing educational services are constantly improving their educational environment by recognizing the importance of physical educational environment. However, most of the existing studies related to education services of universities have been limited to satisfaction with education services and academic achievement. It is time to increase the competitiveness of universities through the behavior intention of positive recommendations by encourage students as beneficiaries of educational services to take positive actions and psychology and promoting their image of universities. In this study, in order to understand the influence of the educational environment that affect the positive recommendation intention of the students, the relationship between the university image and the recommendation intention is examined in terms of the facility-centered educational environment factors from the perspective of the student who is the beneficiary of the educational service.

To achieve the purpose of this study, a survey was conducted on university students studying in Busan, South Korea. The sample obtained through the questionnaire was refined and then analyses were conducted on demographic analysis, validity analysis, reliability analysis, correlation analysis, multiple regression analysis, and moderating regression analysis by using SPSS Version 21.

The results and implications of this study are as follows.

First, the physical educational environment factors of universities including indoor environment, external environment, operation management and convenience were found to have relevant effect on the recommendation intention. Therefore, hypothesis 1-1, hypothesis 1-2, hypothesis 1-3, and hypothesis 1-4 were all supported; therefore, hypothesis 1 was adopted. These results prove that the positive effect on the students from the physical environment of the university is not limited to specific factors. Therefore, universities need to manage all the factors of physical education environment to encourage students' positive recommendation intention. Furthermore, it is necessary to have continuous interest and improvement in physical education environment.

Second, this study examined the moderating effect of university image verified in the relationship between physical education environment and recommendation intention. The university image had a significant moderating effect on the relationship between indoor environment, external environment, convenience and recommendation intention which are sub-variables of physical environment of education. So, hypothesis 2-1, hypothesis 2-2, and hypothesis 2-4 were supported. However, since the operation management did not show significant influence, hypothesis 2-3 was rejected. So, hypothesis 2 was partially supported. Therefore, universities should pay constant attention to and strive for not only physical environment of education but also improved university image.

Despite the results of this study, I would like to suggest future research directions based on the limitations of this study.

In the follow-up study, if the study is conducted through samples from more various regions, the results of the study can be generalized.

In addition, if the detailed items are studied on regional study and the classification of the education system such as the national universities, the private universities, the two-year colleges, and other forms of four-year universities, the study would be more effective.

Keywords: University, Education Environment, Educational Service Quality, University Image, Recommendation Intention

1. Introduction

The goal of university or college education is to improve the learning capacity and produce excellent talents on the part of students.[1] In the global competitive environment, raising excellent talents is essential for securing the competitiveness of universities and survival of universities.

Corresponding to these demands of the times, there are various studies on the improvement of educational services focusing on the quality of education (lecture law) such as the development of educational contents and teaching methods to improve students' academic ability.[2]

In the service industry, differentiation of physical environment has played an important role in improving the competitiveness of companies. When the service provider makes a decision to purchase products and services, the service provider is interested in the physical environment, an additional factor other than the core products and services provided by the service provider. This physical environment has positive or negative effect in the process of consumer's decision making. As such, service recipients rely on the physical environment when making behavioral decisions about the service situation.

Physical environment becomes a stimulus factor and affects the emotional state of the customer. Such emotional result affects the decision-making process of the behavior in the service situation.[4] Due to this importance of

physical environment, service providers such as hotels, restaurants, and concert halls are achieving customer satisfaction through physical environmental research as a marketing strategy.[5] The space that provides service in the service environment is important, and it can be confirmed through the previous studies that interaction between consumers and service providers in this physical environment affects consumer satisfaction and purchase decision making.

Accordingly, in order to understand the influence of the educational environment that affects the positive recommendation intention of the students, this study aims to examine the relationship between the university image and the recommendation intention of the facility-centered educational environment factors from the perspective of the student who is the beneficiary of the educational service. Through this study, it would be possible for universities to get the classification and grasp from various perspectives of the elements of the physical educational environment to improve the learning performance in university education. In addition, based on the observation, it will be possible to prepare a plan for university educational facilities that can improve the learning ability.

2. The Theoretical Background

2.1. High Education Service

Due to the rapidly developing and changing global environment, developed countries have already noticed the change and the importance of competitive human resources and paid attention to the education service for a while. Developed countries in education are making a lot of efforts in various aspects to provide various educational services and to foster competitive talents. In addition, in order to play a leading role in global education service trade, are trying to be recognized for the excellence of educational institutions internationally. This is because universities to be recognized for excellence can attract excellent students overseas on a large scale.

Higher education service is a tangible or intangible education service provided to students who are service beneficiaries in order to achieve the purpose of education by professors and administrative staff who are service providers for the purpose of cultivating useful manpower required by the market. It is a service that meets physical and mental satisfaction to the student who is a service beneficiary from the university's point of view. [6] It is also provided directly and indirectly by the university and contains physical and technical parts in the service.[7] Besides, researchers studying the service say that educational institutions are different from other profit-seeking groups and requires more study on them form a range of perspectives.

The higher education services can be divided into two main services: core services and auxiliary services.

First, core services focuses on the purpose of training human resources on their own. This is the area of education that includes many areas of teaching and learning, such as the teaching method of the professor (lecture method), the preparation of the lecture, the interview with the student, and the interrelationship between the professor and the student.[8]

Second, the auxiliary service is divided into administrative service and physical facility service. The former is a support system for students' education, and the latter is physical facility service, which is a convenience facility.[9] Administrative services include educational support, student support, and attitude of administrative staff, and physical facility services are divided into educational facilities and convenience facilities including library, language institute, and lecture room. Additionally, all the auxiliary service areas provided by the school belong to higher education services: design of the campus considering mobility and convenience, accessibility of student welfare facilities, and convenience of use of convenience facilities such as copying rooms and convenience stores.

Table 1. Division of Higher Education Service

Core Education Service	Auxiliary Education Service	
	Administrative Services	Physical Facility Services (Educational facilities + Convenience facilities)
Teaching Method, Preparation of Teaching Lectures, Interview with Students, Relationship between Professor and Students	Education Support, Student Support, Attitudes of Administrative Staff, etc.	Library, lecture room, campus atmosphere, copy room, convenience store, student restaurant, etc.

2.2. Quality Of Education Service

Service quality is defined as a measure of how well the delivered service level corresponds with customer expectations. As a result of comparing and evaluating the perceived service and the expected service of the service recipient, there are various variables such as technical quality, functional quality, image and functional relationship.[10]

As for the quality of education service, the ultimate goal is education in itself. The goal of higher education (colleges and universities) is to improve the learning capacity and to produce excellent talents and human resources. In the global competitive environment, talents with excellent abilities are essential for securing competitiveness and survival of university. However, the evaluation of quality of education services is not limited to the results of the service. Given there is an aspect to be considered in terms of the interaction between the university (professor,

administrative, and tangibles) as the providers of the service and the student as the consumer, evaluation of the delivery process of the service should be included.

In order to evaluate the service quality that resists an objective estimation, PZB model is useful in that it is a quality measurement tool not only can measure service quality by measuring the awareness of customers who are provided with services but also measure the difference between customer expectations and service performance. [11]

Service quality is determined by customers' subjective judgment. If the expected service of the service recipient is greater than the perceived service, the service quality is not satisfactory. If the expected service of the service recipient is the same as the perceived service, the service quality is satisfactory. If the perceived service performance is greater than the expected service of the service recipient, the service quality is ideal.

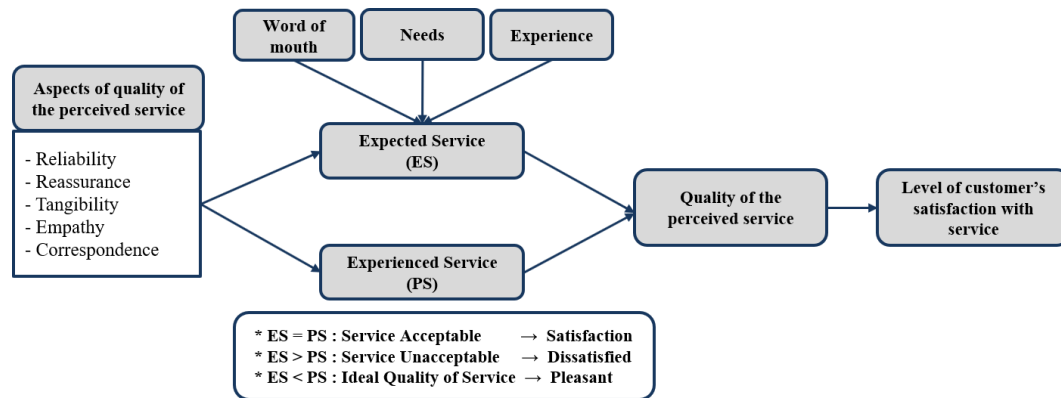


Fig. 1 PZB Model of Measurement on Service Quality [12]

2.3. Image Of University Or College

Image is a concept that human conceives for objects. The images of an organization visualized by awareness and feelings are not only an entire perception and nexus of expectation about the organization but also an aspect established in public. [13] Image of university or college is a holistic concept that people have been aware of and, at the same time, a form that people expect to see. It is a comprehensive concept revolving around people's perceptive attitudes and can be defined as level of familiarity, affection, and expectation towards a college or university that the person who make the image has.

Recently, universities and colleges have been increasingly aware of the importance of image as an independent dimension like corporate image, while the awareness of the management crisis has been heightened due to environmental changes. This means that, unlike the situation in the past that only scale, tradition, resources, and information have been recognized as sources of managing university, image is considered as the most important resource of management in consideration of the complicated and diverse educational conditions such as the autonomy of entrance examination and image differentiation.[14]

The current image of the university is generally based on what kind of history the university had in the past. Therefore, universities cannot change their image through sudden shift of strategies. However, the image of the university can be seen as the relationship between the activities and communication that the university has implemented. The positive image of the university can be formed positively by achieving satisfactory results and earning such success by others, and it can be achieved in a relatively short period of time.

As a result, universities today are investing more in securing new students than ever before in line with changes in the educational environment, and are making efforts to improve the physical education environment to enhance the image of universities. Therefore, universities should also improve the educational environment of universities to improve their image so that their customers have a good image of their universities from now on.

2.4. The Intention Of Recommendation

Intention of recommendation(recommendation intention) is often used as a synonym of word of mouth. Word of mouth in a broad sense is not limited to face-to-face communication based on the experience of individuals, but it is an influence between individuals and groups related to the characteristics of influence.[15] Also, it was defined as communication that is sometimes a source of information by talking to the recipient of face-to-face communication advertisements, his friend and colleague based on personal experience. [16] Word of mouth in this study refers to that in a narrow sense. It is not only a voluntary communication act but also a means of promotion that informally exchanges positive or negative information about personal direct or indirect experience to the surrounding acquaintance, external prospective customers and all the people concerned through the students or parents.

The reason why the effect of word-of-mouth is important in college is that it enables more positive and efficient marketing rather than advertising and publicity campaign through media such as airwaves or newspapers. If students are satisfied with their college and proud, they become public relations agents without knowing

themselves. Besides, their word of mouth is more reliable and more propagating than the mass media as mentioned above so it contributes greatly to the enhancement of university competitiveness

The university can be used as the most reliable and accurate marketing to bring customers, not to visit future customers through word-of-mouth effects. In addition, if the university can accurately identify and diagnose the factors that are to be sought in this study through the understanding and active use of word-of-mouth and if it can use them to establish strategies for university operation, the university will secure higher competitiveness.

3. The Design of the Research

3.1. Surver Object

This study verifies the effect of physical environment of education in domestic universities on recommendation intention and the moderating effect of university image through empirical analysis. For this purpose, a survey was conducted for 61 days from March 1, 2020 to April 30, 2020 for university students attending universities located in Busan. The questionnaire was filled out by personal self-writing method by face-to-face meeting. 300 copies of questionnaire were distributed and 272 copies were collected. Of the collected questionnaires, 245 copies were used for the final study except 27 questionnaires with unfaithful responses. [Table 2] represents a demographical characteristic.

Table 2. Demographical Characteristics

Question	Division	Frequency	Ratio(%)
Gender	Male Students	148	54.4%
	Female Students	124	45.6%
	Total	272	100.0%
Grade	First Grade	52	19.1%
	Sophomore	67	24.6%
	Junior	85	31.3%
	Senior	68	25.0%
	Total	272	100.0%
Majors	Humanities and Social Sciences	62	22.8%
	Engineering	104	38.2%
	Natural Sciences	68	25.0%
	Medical Science	12	4.4%
	Arts and Physical Education	26	9.6%
	Total	272	100.0%
School Attendance Form	In-school	263	96.7%
	A Leave of Absence	9	3.3%
	Total	272	100.0%

3.2. Study Model and Hypotheses

To achieve the purpose of this study, a research model such as [Fig. 2] is presented based on literature research and previous studies. In addition, under the premise that the physical education environment of the university will have a significant impact on the recommendation intention, a proposition was premised that the university image will play a moderating role in the relationship between the physical education environment and the recommendation intention. Based on the premise above, two major hypotheses and eight sub-hypothesis are established as follows.

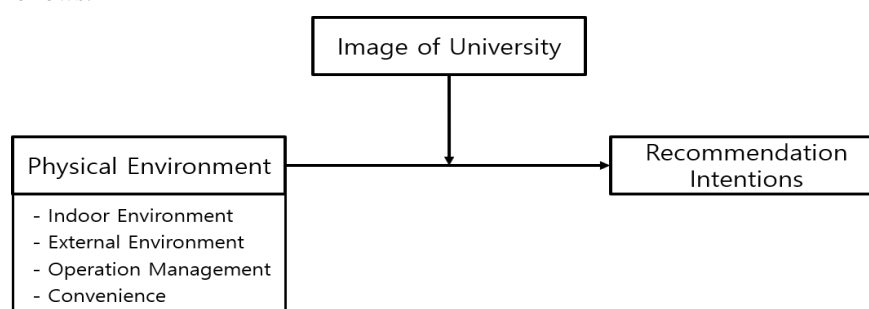


Fig. 2 Research Model

Hypothesis 1 The physical environment of education of university will have a significant effect on recommendation intention.

- 1-1 Indoor environment of university will have a significant effect on recommendation intention.
- 1-2 External environment of education of university will have a significant effect on recommendation intention
- 1-3 Operation management will have a significant effect on recommendation intention
- 1-4 Convenience will have a significant effect on recommendation intention.

Hypothesis 2 The effect of physical environment of education on recommendation intention of university was moderated by image of university or college.

- 2-1 The effect of indoor environment on recommendation intention will be moderated by image of university or college.
- 2-2 The effect of external environment on recommendation intention will be moderated by image of university or college.
- 2-3 The effect of operation management on recommendation intention will be moderated by image of university or college.
- 2-4 The effect of convenience on recommendation intention will be moderated by image of university or college.

3.3. Operational Definition Of Variables

The operational definition and measurement items for the variables used in this study are as follows.

The indoor environment is defined as students’ subjective feelings about the in-school environment. The five measurement items are indoor air, indoor ventilation, indoor temperature control, classroom soundproofing, and indoor structure and size.

The external environment is defined as students’ subjective feelings about external facilities surrounding schools. The five measurement items are landscape facilities, rest and social space, external space composition, exterior of building, and out-of-school atmosphere.

Operational management is defined as student-centered operation such as maintenance of school facilities, school administration, student safety, and school cleanliness. The measurement items are six items: school facilities, appropriate number of elevators and toilets, sufficiency of internet and security facilities, convenience of school facilities, disaster preparedness, and regular cleaning.

Convenience is defined as easy access to the surrounding facilities or environment that students visit and the possibility for the students to use the school safely and conveniently. The measurement items are 6 items: convenience of commercial facilities, convenience of public transportation, proximity to dangerous facilities around the school, walking environment around the school, parks and trails around the school, and community space with the community.

The image of university or college is defined as the positive emotion that the student has about his school. The measurement items are six items such as history and tradition, international exchange, specialization, and global talent development.

The recommendation intention is defined as the intention to convey the positive contents of perceived satisfaction to the surrounding acquaintances based on college life. The measurement items are four questions: word of mouth about education service, recommendation for admission, positive word of mouth, and recommendation.

4. The Empirical Analysis

4.1. Validity And Reliability

The KMO measurement of the research variables was .912, Bartlett’s sphere formation test value was 4471.163, and the significance probability was .0000, which was suitable for factor analysis by rejecting the null hypothesis. [Table 3] Chonbach’s α value as a reliability judgment criterion was .838 for indoor environment, .828 for external environment, .871 for operation management, and .840 for convenience, which was higher than .7 for internal consistency evaluation, indicating that internal consistency was shown. The factor analysis showed that all the scales used for measuring variables have appropriate convergence and discriminant validity. Besides, the reliability level of each variable was generally high, which was found to be appropriate for analysis in this study.

Table 3. The Result of Factor Analysis on Research Variable

Name of variable		Factor loading value	Eigen value	Explanation dispersion (%)	Reliability (α)
Physical environment of education	Indoor environment	.616	3.892	11.794	.838
		.702			
		.525			
		.698			
		.642			

	External environment	.653 .672 .702 .647 .562	3.870	11.792	.828
	Operation management	.592 .623 .726 .734 .697	3.376	10.229	.871
	Convenience	.681 .622 .683 .669 .543	3.313	10.039	.840
Recommendation intention		.613 .580 .672 .699	3.312	10.038	.863
University image		.722 .635 .542 .621	3.037	9.204	.862
Keiser Meyer-Olkin measure of sampling adequacy = .912 Bartlett's test of sphericity $\chi^2 = 4471.183$, df = 528, Significance probability = .000					

4.2. Correlation Analysis

The results of correlation analysis between the main variables are presented in [Table 4]. The indoor environment, external environment, operation management, and convenience of physical educational environment variables all showed a positive relationship with the recommendation intention, which is the result variable.

Table 4. The Result of Correlation Analysis

Name of variable	Indoor environment	External environment	Operation management	Convenience	University image	Recommendation intention
Indoor environment	1.000					
External environment	.521**	1.000				
Operation management	.398**	.380**	1.000			
Convenience	.579**	.577**	.474**	1.000		
University image	.619**	.547**	.334**	.514**	1.000	
Recommendation intention	.513**	.468**	.358**	.547**	.573**	1.000

*p<0.05, **p<0.01

4.3. Hypothesis Test

4.3.1. The Relationship between Physical Environment of Education and Recommendation Intention

Multiple regression analysis was conducted to test the hypothesis 1 on the relationship between physical environment of education and recommendation intention. The results of the analysis are as shown in Table 5. The estimated regression analysis results showed that the F value was 51.194, which was statistically significant at the significance level p<.001, and the R square was 0.461, which means that the physical environment of education- such as indoor environment, external environment, operation management, convenience- showed the experience satisfaction with 46.1%. The D-W value is 2.015, which is close to 2. And it means the value is independent. The variance expansion index (VAF) of all independent variables put into the model is smaller than the standard value of 10, so it is judged that there is no problem with the multiple collinearity between independent variables.

Table 5. The Results of Multiple Regression Test on Physical Environment of Education and Recommendation Intention

Model	Non-standardization coefficient		Standardization coefficient	t	Significance level	Collinearity statistic	
	B	Standard error	Beta			Tolerance	VIF
(Regulation)	.743	.233		3.196			
Indoor environment	.279	.048	.339	5.933	.006**	.718	1.346
External environment	.238	.056	.259	4.250	.000***	.608	1.645
Operation management	.390	.058	.408	6.664	.000***	.601	1.663
Convenience	.097	.052	.119	4.237	.000***	.565	1.918
R ² = .461, Modified R ² = .452, D-W = 2.015, F value = 51.194							

The results of this study show that the indoor environment, external environment, operation management and convenience in terms of physical environment of education increase the positive recommendation intention to the students. Therefore, it can be seen that the physical environment of the university is limited to specific factors and does not have a positive effect on the students. And universities or colleges need to manage all the factors of physical environment of education in order to encourage students' positive recommendation intention. Also, it is necessary for universities and colleges to have continuous interest and improvement in physical environment of education.

4.3.2. The Moderating Effect of University Image

The result of verifying the moderating effect of university image in the relationship between physical education environment and recommendation intention follows as [Table 6].

The result of analysis shows that the overall explanatory power in model 1 is 45.2% (R²=.452) and F=51.194 (p<.001), which is statistically significant. In model 2 which put university image as a moderating variable, the explanatory power was 41.9% (R²=.419) and F=35.998 (p<.001). As for model 3, the sub-variables of physical environment of education such as indoor environment, external environment, operation management, and convenience were put into interaction with university image.

The results of hypothesis 2 being examined in detail, indoor environment and university image combined, external environment and university image combined, convenience and university image combined had statistically significant influence on recommendation intention, and the university image had a moderating effect.

The results of this study show that the university image plays a very important role in the relationship between the physical environment of education and the recommendation intention. Therefore, universities and colleges should continue to strive and pay attention to not only physical environment of education but also to inspire university image.

Table 6. The Result of the Moderating Regression Analysis on University Image

	Model1			Model2			Model3		
	B	β	pvalue	B	β	pvalue	B	β	pvalue
(constant)	.743		.000***	.611		.000***	3.406		.040*
Indoor environment	.279	.339	.006**	.257	.246	.000***	1.472	1.699	.000***
External environment	.238	.259	.000***	.139	.149	.013*	.726	.791	.008**
Operation management	.390	.408	.000***	.208	.197	.007**	-.229	-.241	.500
Convenience	.097	.119	.000***	.247	.251	.000***	.953	1.103	.001***
University image				.314	.316	.000***	-.553	-.553	.171
Indoor environment x University image							.275	1.628	.003**

External environment x University image						.302	.243	.002**
Operation management x University image						.143	.932	.097
Convenience x University image						.497	2.972	.000***
Modified R ²	.452		.419		.337			
R ² variation	.461		.431		.412			
F increment	51.194		35.998		20.501			
Significance probability	.000***		.000***		.000***			

*p<.05, **p<.01, ***p<.001

5. The Conclusion

This study is not only to empirically investigate the influence that physical environment of education on the recommendation intention of the university but also to show the moderating effect of the university image.

This is considered to have a great practical meaning in that it provides implications for the improvement and securing of the physical environment of education and the enhancement of university image.

The results of the empirical analysis of this study are as follows:

First, the physical educational environment factors of universities - indoor environment, external environment, operation management and convenience - have significant effect on the recommendation intention. Therefore, hypothesis 1-1, hypothesis 1-2, hypothesis 1-3, and hypothesis 1-4 were all supported; therefore, hypothesis 1 was adopted.

Second, the moderating effect of university image was verified in the relationship between physical environment of education and recommendation intention of university. The university image had a significant moderating effect on the relationship between indoor environment, external environment, convenience and recommendation intention, which are sub-variables of physical environment of education. So, hypothesis 2-1, hypothesis 2-2, and hypothesis 2-4 were supported. However, the operation management did not have a significant effect, so the hypothesis 2-3 was dismissed. Therefore, the hypothesis 2 was partially adopted.

The implications of the results of the empirical analysis are as follows.

First, the indoor environment, external environment, operation management and convenience of physical environment were found to increase the positive intention of recommendation to the acquaintances around the students. These results prove that the physical environment of the university does not have a positive effect on students, limited to specific factors. Therefore, universities need to manage all the factors of physical environment to encourage students' positive recommendation intention. Also, it is necessary to have continuous interest and improvement in physical environment of education.

Second, it is found that the university image plays a very important role with regard to the relationship between the physical education environment and the recommendation intention. Therefore, universities should continue to strive and pay attention to not only physical education but also to enhancement of the university image.

This study attempted to approach both the educational environment as a physical character and the university image as a psychological character from an integrated perspective. The academic significance of this study is that it established the relationship between physical environment of education and university image through empirical analysis on students studying in universities or colleges. In addition, it proved that efforts to improve the environment and to improve the image of the university should be continued.

Despite the achievements, this study has several limitations. Through the limitations of the study, I would like to suggest future research directions.

First, the selection of samples limited to Busan area might be not sufficient in generalizing the results of the study. If the follow-up study is conducted through samples from more various regions, the results of the study can be generalized.

Second, the study was conducted only with four-year colleges. In future studies, if detailed studies are conducted according to a range of educational systems including national universities, private universities, two-year universities, and four-year universities in various regions, it is expected to draw more effective results.

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