Analysis of Various Influences and Factors on Academic Persistence of Cyber University Students[1]

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Abstract

Since the establishment of cyber universities in South Korea in 2001, there have been high societal expectations for these new institutions of higher learning. However, as the dropout rate for cyber universities is higher than standard four-year universities, matters of quality control are increasingly becoming an issue. This study analyses the factors that influence the expansion and maintenance of student numbers in cyber universities. Of the four-year cyber universities that conferred bachelor's degrees in 2013 and 2014, 17 universities were selected in analyzing the factors influencing academic continuity of cyber university students. This study analyzed cyber universities' offline study halls and study support facilities' locations, the level of university recognition, the rate of expanding teacher facilities, scale of enrolled students, level of competitiveness for university entrance for freshmen students, cost of education per student, scholarships per student, and the proportion of lectures appointed to full-time faculty against the enrollment rate of new students, the proportion of standard high school graduates which indicates the academic continuity of the freshmen enrollment rate, and the enrollment rate of the entire student body and dropout rate. The results show that the level of competitiveness for university entrance for first year students and the proportion of lectures appointed to full-time faculty are factors with a positive effect, with the level of competitiveness for university entrance for first year students having the greatest influence. Such analysis results show that the factors related to the decision making when students select a university have a significant effect on cyber universities' enrollment and continued learning, suggesting that after enrollment, academic experience has a relatively small influence on continued learning. Therefore, there is a need for cyber universities to improve the quality of learning and teaching as well as increase the information available to students for students to choose cyber universities. There is a need for these two policy directions to be promoted simultaneously to improve the relevancy of programs offered by and demanded of cyber universities.

Keywords: cyber university, freshmen enrollment rate, enrolled student retention rate, dropout rate, level of university recognition, located area, scholarship, cost of education, lectures taught by fulltime faculty, competition for admission, graduation type of freshmen student

1. Research Objective

Since the establishment of cyber universities in South Korea in 2001, there have been high expectations for the new cyber universities as a new higher education institution. This is because cyber universities overcome time and space restrictions, and by providing

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high quality learning opportunities at a lower cost to various potential students who wish to continue on to secondary education, they were recognized as a system to meet individual learning needs and reap benefits of state human resource development. In 2010, 10 years after cyber universities were actually opened, the proportion of adult learners 25 years old (or older) was 92%, and there were differences in education between existing offline university education and education that was offered online [7, 8]. However, the stability of the online education system, the excellence and appropriateness of educational contents, adequacy of related education support services and other issues surrounding the quality of education were raised, particularly the issue of high dropout rates highlighted by previous research that stood at 39.3% and was much higher compared to 4.3% for standard 4 year universities [5, 6].

As awareness of these issues grew, pre-research on the inspection and improvement of the quality of cyber universities, and research related to the dropout rate of students were conducted. In terms of quality control, although the societal impressions of cyber universities are positive, due to the low tuition cost of current cyber universities among other things, there are realistic issues regarding management. In order to provide a high quality education service, there needs to be policies and measures that can verify the level of quality as superior and above standard. When conducting quality control for the management of achievements of cyber universities, there is a need for a balanced approach of the aspects of commitment, process and results. In particular, regarding the student component in the aspect of commitment, it is proposed that there is a need to consider the purpose of enrolling, academic motivation, acquisition of previous knowledge and so forth, with importance. An evaluation model has also been proposed to examine the excellence of cyber universities. In order for cyber universities to go beyond quantitative expansion and to enter a mature stage of possessing qualitative competitiveness, there is a need for evaluation to enhance and develop the quality. In order to realize this, is has been proposed there is a need for an evaluation model, comprised of the individual component, university component, and societal component, that also takes economic effectiveness into consideration at the same time. In addition to this, the key to quality control of cyber universities is already a well-established platform, with expertise of content development and know-how of course management being important points rather than organizational, administrative, and institutional elements. There is also a claim proposing support strategies for students and teaching staff. Studies on student numbers that are being conducted on cyber universities do not take into consideration the distinct characteristics pertaining to cyber universities. They also present the need to consider the expansion of educational conditions of cyber universities aspect and freshmen recruitment status in student number, or student pool, policies. Regarding previous research on dropout rates based on case studies of select incidents of certain universities, there are studies examining the relationship between learner related variables and the dropout rate, emphasizing the importance of the learning problems faced by the online learner by increasing student and teacher interaction. There have also been research presented that analyze the main variables for predicting high likelihood dropouts, which are potential dropouts whom will most likely convert to actual dropouts. The result of analyzing cases of select universities show that the total number learning hours, the course of study and class content, and the number of lectures accessed etc., are statistically significant [1-8].

Consequently, preceding research has appeared under two main trends. First, a conceptual framework of quality management standards for quality control of cyber universities comprised of a performance evaluation model, results management, and others to establish a quality management system [1-4, 7]. Second is the research that analyzes the factors that influence the dropout rate of cyber universities [5, 6, 8]. In the preceding case studies and research, as they were unable to actually to analyze the factors that influence the selection and maintenance of enrolled students of cyber universities, a

select number of universities served as case studies for the analysis focusing on the individual variables for students and the teaching and learning process. Also, there is the aspect of analyzing with an emphasis on the quotient related to one area of cyber university students' academic continuity, and they are limited as they did not research the differences in freshmen distribution ratio according to the high school graduation type of cyber university freshmen, or the characteristics unique to freshmen. The research subjects selected were the 12 national four-year cyber universities that conferred 4-year bachelor's degrees and utilized the 2013, 2014 University Information Disclosure. This research analyzes how the characteristics of universities, university commitment and process variables, variables of freshmen characteristics influencing student enrollment and retention of cyber universities, the influencing factors on the leading indicators to comprehensively consider the dropout rate and academic continuity of cyber university students. Through such analysis, this study presents the factors affecting student selection and enrollment, student retention and academic continuity, and provides policy directions recommendations to increase continuity of learning at South Korea's cyber universities' student enrollment after admission [9].

2. Research Target Audience and Methodology

The research subjects were 17 four-year cyber universities that conferred bachelor's degrees schools in the 2013, 2014 University Information Disclosure [10]. Analysis shown in Table 1 had a generalized linear mixed model applied. SPSS 21 was utilized for the analysis.

Table 1. Research Analysis Model

Category	Independent Variable	Dependent Variable
Random Effects	-Location of university (metropolitan, megalopolis, province) (central location of learning centers, university headquarters, library and other offline management and support centers)	-Enrollment rate of first year students (Total registered/Total Recruited) X 100 -Enrollment rate of registered students (Enrolled Students/(Total student body-Total Students Recruited)) X 100 -Dropout rate (Number of Dropouts/Number of Enrolled Students) X 100
Fixed Effects	[Composition of High School Graduate Freshmen] - Proportion of freshmen completed standard high school curriculum (Number of freshmen graduated from standard high school)	
	[University Characteristics Variables] -Regional characteristics (capital, metropolitan, provinces) -University recognition (Using the same corporate body as an existing 4-year university, or using the same name, brand and reputation of the university)	
	[Investment Variables] -Rate of university buildings and facilities -Number of enrolled students -Level of competition for university entrance, -Cost of education per student (1,000 won) -Scholarships per student (1,000 won)	
	[Process Variables] - Proportion of lectures appointed to full-time faculty	

3. Analysis Results

The results of the descriptive statistics analysis of university characteristics, commitment and the main variables are presented in Table 2. The research subjects comprised of 17 cyber universities, of which 11 were located in the capital, 3 in metropolitan cities, and 3 were provincial universities. The universities can be divided into 12 universities with high levels of recognition and 5 universities with low levels of recognition. All 17 cyber universities were private universities.

Table 2. Results of Descriptive Statistics Analysis of University Commitment and Process Variables

Category		Enrolled Student Retention	Dropout rate	Freshmen Enrollment Rate
Province	Average	76.7	16.5	51.3
	Sample size	6.0	6.0	6.0
	Standard deviation	13.2	4.1	22.7
Metropolitan	Average	72.0	15.3	41.0
	Sample size	6.0	6.0	6.0
	Standard deviation	13.7	6.7	10.1
Capital	Average	90.1	18.2	47.2
	Sample size	22.0	22.0	22.0
	Standard deviation	16.1	4.4	13.3

Category		Enrolled Student Retention	Dropout rate	Freshmen Enrollment Rate
Low Recognition	Average	75.4	19.8	48.1
	Sample size	10.0	10.0	10.0
	Standard deviation	12.4	7.1	20.9
High Recognition	Average	88.3	16.4	46.3
	Sample size	24.0	24.0	24.0
	Standard deviation	17.0	3.1	11.7
2013	Average	77.3	16.6	46.4
	Sample size	17.0	17.0	17.0
	Standard deviation	14.9	3.7	14.2
2014	Average	91.8	18.1	47.3
	Sample size	17.0	17.0	17.0
	Standard deviation	15.6	5.6	15.5
Total	Average	84.5	17.4	46.8
	Sample size	34.0	34.0	34.0
	Standard deviation	16.7	4.8	14.7

Category		Rate of buildings and facilities	Number of Enrolled Students	Admissions Competitiveness	Education cost per student	Scholarships per student	Full time faculty teaching lectures
Province	Average	115.0	3,285.0	1.0	2,882.2	983.9	36.3
	Sample size	6.0	6.0	6.0	6.0	6.0	6.0

	Standard deviation	45.8	943.9	0.1	566.5	559.8	16.2
Metropolitan	Average	240.8	1,675.7	1.2	4,294.2	1,658.5	35.4
	Sample size	6.0	6.0	6.0	6.0	6.0	6.0
	Standard deviation	100.6	766.1	0.2	1,519.4	710.8	6.7
Capital	Average	216.7	6,947.0	1.3	2,787.0	755.3	40.3
	Sample size	22.0	22.0	22.0	22.0	22.0	22.0
	Standard deviation	129.1	3,734.3	0.3	887.5	367.5	11.7

Category		Rate of buildings and facilities	Number of Enrolled Students	Admissions Competitiveness	Education cost per student	Scholarships per student	Full time faculty teaching lectures
Low Recognition	Average	162.5	2,162.5	1.2	3,898.6	1,291.8	29.0
	Sample size	10.0	10.0	10.0	10.0	10.0	10.0
	Standard deviation	69.2	835.7	0.3	521.3	446.1	8.0
High Recognition	Average	219.9	6,707.3	1.2	2,724.4	814.8	42.7
	Sample size	24.0	24.0	24.0	24.0	24.0	24.0
	Standard deviation	132.5	3,676.2	0.3	1,112.7	566.6	10.7
2013	Average	223.6	5,377.8	1.2	3,075.7	770.9	38.7
	Sample size	17.0	17.0	17.0	17.0	17.0	17.0
	Standard deviation	107.1	3,906.5	0.3	1,350.7	568.5	11.9
2014	Average	182.5	5,363.4	1.2	3,063.8	1,139.2	38.7
	Sample size	17.0	17.0	17.0	17.0	17.0	17.0
	Standard deviation	130.4	3,697.5	0.3	846.4	527.8	11.9
Total	Average	203.0	5,370.6	1.2	3,069.8	955.0	38.7
	Sample size	34.0	34.0	34.0	34.0	34.0	34.0
	Standard deviation	119.4	3,745.4	0.3	1,109.9	571.6	11.7

Universities located in the capital have comparatively excellent rates of enrolled students, expanding faculty facilities, and proportion of lectures appointed to full-time faculty, but the standards for student dropout rates, the cost of education per student, and supporting scholarships were found to be inadequate. For universities in the metropolitan and provincial areas, dropout rates, cost of education, scholarships etc. were relatively excellent, while the university facility expansion rate and proportion of lectures appointed to full-time faculty were found to be relatively inadequate, and significant differences between cyber universities based in the same regions were also found to be present. Therefore, it is difficult to conclude that a cyber university's relevant indicators and performance are excellent based on its location and region, for example, if it is located in the capital, a metropolitan city or a region equipped with good environmental infrastructure. However, when observing the results of analyzing the performance of universities based on recognition and fame, there is a tendency for universities with

higher levels of recognition and fame to have more excellent performance. For universities with high recognition, the dropout rate is low and the freshman enrollment rate is high. In addition, student academic performance and related faculty facility expansion rate, and proportion of lectures appointed to full-time faculty were found to be relatively excellent, and while the cost of education and scholarships were inadequate, competition for freshman admission appeared to be the similar level. Therefore, cyber universities with levels of high recognition and fame have the advantage of a high faculty facility expansion rate and a high proportion of lectures appointed to full-time faculty. However, as there exists a large difference in the standard deviation of performance indicators of cyber universities with high levels of recognition compared to other universities, it cannot be concluded that high recognition is a characteristic that has a direct affect, and it also cannot be claimed that high levels of recognition cause the standard of various indicators to be excellent. When comparing with the expected status of 2013 with 2014, the enrolled student body retention rate and scholarships had improved, and the dropout rate and faculty facility expansion rate weakened, while other indicators showed a tendency to maintain to similar levels.

The variables of university characteristics and freshmen high school graduation type distribution status are presented in Table 3. The proportion of standard high school graduates stood at 84.5% in 2013 and 84.5% in 2014, and the proportion of vocation-focused high school graduates was 30.6% in 2013 and 34.9% in 2014. The proportion of admitted freshmen with alternative high school qualification or equivalence was 15.7% in 2013, and 15.5% in 2014. Overall, of the freshmen pool, the proportion of freshmen that graduated from a standard high school education was the highest, and it can be seen that the proportion of vocation-focused high school graduates was also increasing. When comparing the proportion of standard high school graduates (including grade repetition students) from the total freshmen student pool of four-year universities, it stood at 96.8% in 2013 and 96.4% in 2014, while the high school graduate composition of cyber universities was much more diverse that standard universities [11]. The proportion of standard high school graduates were decreasing in metropolitan cities and the capital, whereas it was increasing for cyber universities located in provincial regions, and decreasing for universities with high levels of recognition and increasing for universities with low levels of recognition. Accordingly, it can be seen that the rate of standard high school graduates at provincial cyber universities with low levels of recognition is increasing. The proportion of freshmen students that are vocation-focused high school graduates is increasing for universities in all regions, with high and low levels of recognition. Notably, the range of increase was larger the more the cyber university with low levels of recognition was located in the provinces. The proportion of freshmen students that did not graduate from a standard high school education is increasing for cyber universities located in metropolitan cities and the capital yet decreasing for universities located in the provinces, increasing for universities with high levels of recognition and decreasing for universities with low levels of recognition.

Table 3. Descriptive Statistics Analysis of Variables of University Characteristics And Freshmen High School Graduation Type

Category		Proportion of Freshmen that are Standard High School Graduates	Proportion of Freshmen that are Vocation High School Graduates	Proportion of Freshmen that are not Standard High School Graduates (alternative high school equivalence)
Year	2013	84.35%	30.61%	15.65%
	2014	84.54%	34.90%	15.46%

Metropolitan	Subtotal	77.09%	36.06%	22.91%
	2013	79.00%	33.95%	21.00%
	2014	75.17%	38.17%	24.83%
Capital	Subtotal	87.07%	33.27%	12.93%
	2013	88.02%	32.24%	11.98%
	2014	86.29%	34.11%	13.71%
Provinces	Subtotal	83.09%	28.44%	16.91%
	2013	78.69%	22.38%	21.31%
	2014	87.50%	34.50%	12.50%
Low Recognition	Subtotal	84.70%	29.65%	15.30%
	2013	81.76%	24.99%	18.24%
	2014	87.65%	34.30%	12.35%
High Recognition	Subtotal	84.34%	34.36%	15.66%
	2013	85.65%	33.42%	14.35%
	2014	83.24%	35.14%	16.76%
Total		84.45%	32.89%	15.55%

Analysis of factors that influence, and the strength of that influence on the rate of freshman enrollment, enrolled student number retention, and dropout rate are presented in Table 4. When considering the level of significance and the size of the coefficient values, the level of competition for freshmen admission and the proportion of graduates of standard high school education appear as influential factors on freshmen admission rate for cyber universities. The level of competition for freshmen admission has a positive effect for the rate of freshmen admission, and the proportion of graduates of standard high school education has a negative effect on the rate of freshmen admission. The factors of scholarships per student and the proportion of lectures appointed to full-time faculty appeared as having an effect on the rate of student retention. The factors of scholarships per student and the proportion of lectures appointed to full-time faculty both appeared as having a positive effect on the rate of student retention, and the size of the effect was low compared to the effect that the level of competition for freshmen admission and the proportion of graduates of standard high school education had on freshmen admission. The factors influencing the dropout rate were the level of competition for freshman admission and the proportion of graduates of a standard high school education. The level of competition for freshmen admission and the proportion of graduates of standard high school education both had the effect of lowering the dropout rate, and it can be seen that this has a positive effect of expanding the number of enrolled students at cyber universities. Although the effect that the influencing factors for the dropout rate, level of competition for freshmen admission, and the proportion of graduates of standard high school education had appears to be greater than the size of the effect regarding scholarships per student and the proportion of lectures appointed to full-time faculty on the rate of student retention, it's effect appears relatively small when compared to the size of its effect on freshmen admission rate.

The geographic characteristic, a variable characteristic of cyber universities, was not found to be statistically significant in this analysis. The results also showed the level of recognition of the university as not statistically significant. Among other commitment variables, the rate of facilities was also not statistically significant, and also the effect of the scale of the university represented by the number of enrolled students on the academic continuity of students of cyber universities was not statistically significant. The variable of cost of education per student, representative of the quality of education of the university, also appeared as statistically insignificant.

Table 4. Impact Analysis of Independent Variables on Dependent Variables

Category			Freshmen Enrollment Rate	Total Student Enrollment Rate	Dropout Rate
Random Effects	Location		617.00	15.75	16.13
Fixed Effects	Geographic Characteristics	Provincial	0.16	-4.87	-1.91
		Metropolitan	-3.25	-12.76	-8.62
		Capital	0	0	0
	University Recognition	Low	-0.32	6.73	2.78
		High	0	0	0
	Faculty Facility Expansion Rate		-0.01*	-0.05	0.00
	Number of Enrolled Students		0.00*	0.00	0.00
	Entrance Competitiveness		**9.58***	10.48	**-7.35***
	Cost of Education per Student		-0.00	-0.00	-0.00
	Scholarships per Student		-0.00	**0.02***	0.00
	Rate of Lectures Taught by Fulltime Faculty		0.33	**0.83****	-0.06
	Proportion of Standard High School Graduates		**-28.01***	-19.96	**-18.40***

'**' $p<.01$, '*' $p<.05$

4. Conclusion and Suggestions

Examining the overall management performance of cyber universities, the performance related to the academic continuity of the students of cyber universities located in the capital and cyber universities with high levels of recognition appears to be excellent, especially in the area of enrolled student retention rate. On the other hand, the dropout rate and freshmen retention rate were not affected by university characteristics. However, when comparing cyber universities with high levels of recognition to those with low recognition, the performance of the enrolled student retention rate and dropout rate were all excellent. In particular, despite that the cost of education per student, scholarships per student *etc.*, for cyber universities with low levels of recognition compared to those with high recognition is comparatively excellent, the academic continuity of their students appeared unsatisfactory compared to universities with high levels of recognition. It was analyzed that overall, cyber universities with high levels of recognition maintained enrolled student retention rate and prevented dropouts on the basis of their strengths such as the online/offline infrastructure, the scale of the university, expanding faculty, and course participation. Therefore, it can be seen that characteristics such as the reputation

and level of recognition of the Cyber University and geographic location have an indirect effect on the academic continuity of cyber university students.

When examining relevant analyses regarding freshmen based on the type of high school completion received, the proportion of students that graduated from a standard high school and the proportion of students that completed high school through alternative means of equivalence in the freshmen pool are similar. However, there is a reverse phenomenon occurring where for cyber universities with high levels of recognition or located in the capital, the proportion of standard high school graduates decreases and the proportion of students that completed high school through alternative means of equivalence increases, while cyber universities with low levels of recognition have a high proportion of standard high school graduates and a low proportion of students that completed high school through alternative means of equivalence. In addition, there is an overall increase in the proportion of graduates from high schools operated with a focus on vocation, regardless of location or levels of recognition. As such, the fact that cyber universities have freshmen students with different high school completion backgrounds compared to standard universities provides evidence of how cyber universities have fundamentally different roles and purposes compared to standard universities. If the cyber universities' composition of freshmen that break away from the high school graduate focus has a positive effect on the inherent purpose and establishment on its identity, then there is a need to place interest in the phenomenon of the decreasing proportion of freshmen with alternative qualifications in cyber universities with low recognition in provincial areas. In particular, the effect of the freshmen distribution ratio on academic continuity has large implications for future management and operations strategies for cyber universities, especially considering the circumstances where the academic continuity of students of cyber universities with low levels of recognition and cyber universities located in provincial areas being unsatisfactory compared to universities with high recognition. The fact that the proportion of standard high school graduate freshmen students is increasing for cyber universities with relatively low levels of competition for freshmen admission, which are low for a variety of reasons, suggests that as a result the willingness and tendency of the main target learners for cyber universities to attend cyber universities is decreasing, and it can be seen that it was caused by cyber universities with low levels of recognition admitting high school graduates for freshmen student retention rates. It is possible to interpret and understand the increase in the proportion of vocation-focused high school graduates along the same lines. As such, the increase of admitting high school graduates to address the issue of maintaining the enrolled student retention rate suggests that the competition for freshmen admission in South Korea needs to expand for both cyber universities and standard universities. From the situation of both standard four-year universities and technical universities having the same school-age level population, it is possible to give meaning to the point that many of the high school graduates that apply and are admitted to cyber universities, would rather that they were admitted to a university, rather than being satisfied for being admitted to a cyber university. In such circumstances, it will be difficult to increase the academic continuity and continuity of cyber university students.

The results upon analysis of cyber universities' freshmen enrollment rate, rate of retention of enrolled students, and dropout rate show that the location and level of recognition of the university does not have any effect, and neither do the investment factors of the rate of neither expansion of faculty facilities nor the cost of education or scholarships. When considering these variables are characteristic variables of cyber universities, the size of the influence on the characteristic of academic continuity of cyber university students is not that huge. In addition, the commitment factors of the scale of enrolled students, expansion rate of facilities, the cost of education per student was shown to not be influential. The freshmen admission rate for cyber universities, enrolled student retention rate, and the dropout rate and other influencing factors with a positive effect on

student's academic continuity was the commitment variable of the level of competition for freshmen admission, and the process factor of the proportion of lectures taught by full time faculty members, and the scholarships available per student. Also, the proportion of standard high school graduates of freshmen simultaneously had a positive and negative effect on the academic continuity of cyber university students. The level of competition for freshmen admission was found to have a positive effect on the rate of retention of enrolled students and the rate of freshmen enrollment, whereas the rate of lectures appointed to full time faculty and scholarships available per student has a positive effect on the rate of retention of enrolled students. The proportion of graduates from standard high schools in freshmen simultaneously had a negative effect on the freshmen enrollment rate and a positive effect on the dropout rate. When examining the size of the effects of the factors, competition for freshmen admission and the proportion of graduates from standard high schools had large effects, and the size of the effect for scholarships available per student and the proportion of lectures taught by full time faculty members were comparatively very small.

These results show that in regards to cyber university student admission, enrollment and maintaining academic activities, the level of preference a student has for a universities' admission has a strong effect. In other words, rather than university support, commitment and other educational conditions being influential, the level of preference for the university when students are selecting universities is more influential. This means that the level of preference for a university is related to the level of recognition, reputation and other related factors, and accordingly the existing popularity of the university and its location can be applied as important factors to maintain the academic continuity of students. In addition, regarding the teaching and learning process, teacher participation and the standard of teaching has a positive influence on the rate of continued learning of students. However, the size of the effect is very small compared to the factors associated with freshmen admission and enrollment preferences. Therefore, support and investment of cyber universities in their students do not have enough effect for learners to continue their studies. The image of the university or recognition and fame can have an indirect effect on whether the learning process begins and whether it is continued.

In particular, the effect that the freshmen admission rate and the level of preference of the applicant has on the continued learning of the student suggests that cyber universities are being influenced by the existing structure of factionism tied to one's alma mater in South Korea. In addition to these increases, it suggests the possibility of cyber universities with high levels of recognition having relatively excellent educational conditions. When such results of consumer choice and random evaluation are accumulated, it can be known that the cause of the consequential phenomenon is simultaneously both the cause and the effect, having a cyclical relation. If this is the case, it provides the opportunity for a new secondary school education that does not conform to the existing university system, and it is possible to assume the societal phenomenon of cyber universities failing to meet their original objects of improving national human resources is occurring, which has implications for research and policy implementation for the future of cyber universities. When the influence of the freshmen admission decision is high, there is a need to pay attention to the results of cyber university freshmen admission. Currently, the proportion of standard high school graduates is decreasing for cyber universities with high levels of recognition and increasing for those with levels of low recognition. As an institution of higher learning with an educational curriculum with fundamentally different characteristics to a standard offline university, the highest proportion of freshmen for cyber universities are standard high school graduates at 78% which is at least 20% lower than standard universities, and the proportion of students that did not complete high school in a standard way is at least 15%. Recently, the proportion of students from technical and vocational high schools, as well as specialized high schools, has increased. When examining the characteristics of cyber universities, the fact that there is a greater

proportion of students with alternative high school completion or equivalence compared to standard high school graduates can be viewed as the response to the societal expectation, or purpose of establishing cyber universities. In addition, the cause for the increasing proportion of standard high school graduates in provincial cyber universities with low levels of recognition is both a strategy to fill the freshmen pool and the response to the lack of applicants. In such a case where cyber universities recruit freshmen students to maintain the student pool without considering the function of recruiting, student applicants will choose cyber universities simply to be admitted to a university or choose a cyber university that meets their level of competitiveness in order to be admitted to a university. This phenomenon prevents cyber universities from conforming to its purpose and goals.

These results suggest that the proportion of standard high school graduates in freshmen has a negative effect on freshmen admission. However, the fact that the proportion of standard high school graduates of cyber university freshmen has more than just a negative effect cannot be overlooked. The proportion of standard high school graduates in college freshmen has the effect of lowering the dropout rate. Accordingly, even though is it is disadvantageous for freshmen admission, from the perspective of enrolled student retention and the dropout rate after admission, having a high proportion of standard high school graduates in freshmen brings positive effects. Although the proportion has been recently decreasing for cyber universities with high levels of recognition, the distribution ratio of high school graduates is still high, relatively excellent dropout rates and enrolled student retention rates, the freshmen enrollment rate is similar to cyber universities with low levels of recognition. Consequently, when considering the perspective of maintaining student academic continuity, in the long term, there is a need to maintain a stable proportion of high school graduates while simultaneously increasing students with alternative equivalent qualifications, and to build academic support strategies and systems to reduce the dropout rate.

In the future, the values of cyber universities need to be established and as an institution of higher education, in order to meet societal expectations, there needs enhanced education satisfaction levels through improvements in the quality of the teaching and learning process. It is necessary to expand the diversity of information available for students when selecting a university. These two policies need to be promoted at the same time and there is a need to improve the connectivity between the demand and supply of cyber university programs, in addition to increased effort to increase freshmen resources in line with the characteristics of the cyber university.

To evaluate the quality and standards of cyber universities, there need to be diagnosis and reviews for a variety of aspects. In particular, to address the major issue raised of the high dropout rate and other related issues, there needs to be future research conducted to reveal the factors that affect student university selection and application, enrollment, re-enrollment, and the graduation process.

This study, which was limited to the Information Service of Higher Education in Korea, has limitations of aspects of cyber universities' teaching and learning process not included in the analysis model. There is also the limitation of not having considered the diverse freshmen characteristics in the model. In the future, there is a need for a comprehensive approach to a variety of relevant factors, and for research to be conducted that reveals how the level of competition for freshmen admission is related to the applicant's selection of a cyber university, and the various factors that affect the university selection decision making process. For university academic continuity, in addition to the influences of each university's characteristics, there also exist influential individual characteristics of the learner. As a result, there is a need for a model that comprehensively considers factors from a variety of perspectives to be applied to future research.

This study conducted analysis placing central importance on the issue of student academic continuity of cyber universities and other associated issues, as an aspect of

cyber university achievement and performance. However, it is limited to the claim that cyber university's achievement and performance is defined only by student academic continuity. Consequently, future analysis and comprehensive research considering student academic achievement, student improvement, and development of employment abilities, individual student change and development, as well as studies per university, volunteer service and achievement is required. Finally, the strongly influential variables of the educational curriculum or teaching-learning activities that differentiate a cyber university from a standard university need to be discovered, and by being applied in research, the validity of Cyber University related research needs to be reconsidered.

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