Analysis of antecedent factors in academic achievement and student retention

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Abstract

Purpose – Student achievement and retention are two important components that indicate the quality of a university. This is in line with one of the standards of university accreditations regarding the quality of students and graduates, which are set by BAN-PT, an institution that guarantees the quality of National Education Service delivery at every university in Indonesia. The purpose of this paper is analyzing the internal and external factors that contribute to academic achievement and student retention.

Design/methodology/approach – This paper is a causal explanatory-based study, using multiple regression analysis among five independent variables and two dependent variables separately. Several sequential tests are conducted to maintain the proper research results, such as reliability, normality, multi-collinearity and heteroscedasticity.

Findings – This paper provides empirical facts that student motivation has a significant positive impact on the level of student academic achievement, and the quality of lecturers has a significant positive impact both on student academic achievement and retention rates.

Research limitations/implications – This study is conducted within the context of a university. The generalization in the study is low. Researchers are encouraged to explore further.

Practical implications – This paper is expected to provide constructive feedback to university management in setting policies that are oriented toward strategic actions to optimize academic achievement and maintain their students.

Originality/value – This paper provides insights of good university governance concerning in higher education management.

Keywords Student, Family, University, Lecturer, Academic advisor

Paper type Research paper

1. Introduction

As one type of institution engaged in services, universities provide educational services to their students, both at the undergraduate or diploma level, as well as postgraduate (master's or doctoral) degrees. The sustainability of higher education is very much determined by the synergy of the performance of each faculty and the study programs it supports. The performance of a university will be guaranteed if it is nationally recognized by the relevant authorized institution, which in this context is the National Accreditation Board for Higher Education (BAN-PT). According to Wikipedia, BAN-PT is the only accreditation body that obtained authority from the Ministry of Research, Technology, and Higher Education of the Republic of Indonesia in improving the quality of higher education, introducing and disseminating "new paradigms in the management of higher education" and increasing relevance, academic atmosphere, institution management, efficiency and sustainability of

university. Referring to the accreditation forms system established by BAN-PT, there are nine standards that become assessment factors, which include vision, mission, goals and strategies; governance, management, and cooperation; college student; human resources; finance, facilities and infrastructure; education; research and community service. Among the nine standards, the quality of students and graduates are the crucial aspects that must be concerned by the university. The goodness of two factors contribute to the final result of BAN's accreditation evaluation of a university, which is grade A reflects that the university shows its national eligibility (recommended) to every students because already fulfilled all those nine standards of a great university. The credibility of a university is determined by the quality of its students. Student achievements will be a benchmark for the success of a university in the eyes of end-users who will empower them in the corporate world. This is called "external to external stakeholders". In terms of externalities, the reputation of a university from the perspective of graduate users is determined by the achievements of its graduate students.

Student performance can be measured from many aspects, one of which is through academic achievement. Student academic achievement can be appraised by the amount of their grade point average (GPA) achieved and the social activities they carry out through the intensity of their involvement in student activity units available at the university or study program where they study. In order to maintain the quality of graduates, study programs need to analyze and identify the factors that contribute to the academic achievement of their students. The study programs must be proactive because the graduate students will carry the "good name" of their alma mater when they begin to take part in the world of work in the company environment where they will work later. Continuity of the success of students' academic achievement needs to be created and maintained through the effectiveness of the university's management of various aspects that can influence the achievement.

Students are university business sources and partners. The long-term sustainability of a university depends on the continuity of the satisfaction of its students on the performance of the institution in which they are studying. The positive perception of students regarding the quality of education delivery is reflected in their decision to remain committed in completing studies from the time they enter college until their graduation. A university can be said to be successful in realizing its quality management and customer relations if its students show high loyalty in their actions to keep their education contracts with the university. This is what is called the student retention rate. The success of a university in maintaining its students indicates that there is a consistency of students' trust in the university they choose.

The university's interests are seen by various stakeholders, such as society, government, parents of students and students themselves. University really needs to pay attention to the ability of their students as a form of normative responsibility in which educational institutions should provide the best service, one of which is reflected in monitoring and handling student academic achievement. From the point of view of morality, the university's concern for the academic achievements of its students is also a form of realization of social and moral responsibility, which needs to motivate their students so that they have the enthusiasm to achieve the best achievements in the education they are going through. High quality management of higher education will create an atmosphere of a comfortable, pleasant and positive university environment for students who are in it. This stimulus is expected to be an external source of energy which directly motivates students to continue their studies until they finish their university studies. University reliability is proven by how well they can generate graduates with very satisfying academic performance and maintain the commitment of their students in their education.

The success of university relied on how well its management responds to change. Today, disruption era crucially affects many aspects of life, education is one of them. The advancement of technology drives university in creating and conducting teaching and learning system within digital space, where every lecturer and student interact indirectly

through media, such as electronic devices, software and the Internet. The fact is education disruption already happened, that is, through open universities. Both open and non-open universities continuously need to focus seriously in running their education system, focusing on the performance of their students. The goodness of a sustainable university is seen from the greatness of its students from different generations, in terms of numbers and capabilities.

2. Literature review

Academic performance of student can be seen from the GPA obtained. The index shows the achievement scores of students per semester in an aggregate manner from the time students go to college to the latest conditions. The index also reflects the accumulated consistency of student achievement for all courses that have been taken. Each course usually consists of three measurement components, namely, the Mid Semester Exam (UTS), Structured Academic Activity (KAT) and the Final Semester Examination (UAS). The composition of the three components varies according to the policies of each lecturer, with weights ranging from 20 to 50%, but there are also a number of lecturers who emphasize the KAT value because the subject is considered to emphasize more on aspects of practice and active participation. The final grade criteria for each course are grades A (equivalent to 4) with a range of values equal or greater than 80, grades B+ (equivalent to 3.5) with a range of values greater than 73 to less than 80, grades B (equivalent to 3) with a range of values greater than 67 to less than 73, grades C+ (equivalent to 2.5) with a range of values greater than 61 to with less than 67, grades C (equivalent to 2) with a range of values greater than 55 to less than 61, grades D (equivalent to 1) with a range of values greater than 41 to less than 55 and grades E (equivalent to zero) with a range of values less than 41. Achievement Index (GPA) is obtained from the accumulation of the final conversion value multiplication in the form of numbers with weighted credits (semester credit units, usually around two or three credits where one credit is equivalent to 50 min of weekly meeting in the class) for each course, while the GPA is the average student GPA for each semester. Aside from the GPA, academic achievement can be evaluated from the participation of students in various activity units at the university. Student participation in various organizations on campus, both at the level of study programs or faculty members and universities, such as student affairs, nature lovers, choirs, spirituality or religion and the like; be an indication that the student has a positive desire to develop and actualize his personality, both for himself or herself, the institution and others. Students can be smart in hard skills through teaching and learning in the classroom and capable in soft skills through empowering themselves in the community on campus, so they have a whole academic achievement.

Students are the main customers of the university. The existence of a university is not merely determined by the academic achievements of its students but also by its ability to retain students to continue their studies at the university. The student retention rate shows the student's confidence in his or her university. A high student retention rate indicates that the university has a good performance regarding management's commitment to service quality in maintaining students' trust in the quality of education provision from the university which they have decided to enter from the beginning. A low student retention rate indicates that there are aspects of service that need to be addressed immediately by the university which undermine the commitment of students to continue their education at the university. Student retention really needs attention from a university because this can be contagious, both to fellow students at the university and also prospective students who have the potential to approach or stay away. Hennig-Thurau *et al.*, (2001) prove that the quality of teaching and student emotional commitment to the institution is very important to the student's loyalty to his or her university. Another study finds that there are several things affecting student retention, such as academic advising, social connectedness, student

involvement, faculty and staff members approachability, business procedures, learning experiences and student support services (Chuah and Lim, 2018).

There are many factors that contribute to the advancement of academic achievement and student retention, both from internal and external factors. External factors derive from the personal and family of the students themselves, while external factors derive from universities, lecturers in the class and academic advisor. Good motivation actually comes from us. Motivation speaks of will, effort and persistence. The performance of a student is sustained by himself or herself. Although this is true, students are also human beings who cannot be separated from the emotional elements that can influence him or her in showing attitudes and behavior. The atmosphere of emotions can be influenced by environmental conditions around the students themselves, both direct and indirect environments. In this context, the immediate environment means the families of students who can play a role in creating an atmosphere that influences the spirit of students in carrying out their education, especially if between students and family students have a close relationship both physically and/or psychologically. The indirect environment of students is related to the condition of the university as a "second home" for him or her as a learner. The quality of the university, the competence of lecturers and the role of academic advisors as mentors can be a catalyst for student success in achieving academic achievement as well as consideration in his or her decision to continue his education at the university.

According to Suhaily and Soelasih (2015), physical and psychological stability (manifest or behavior) of students determines their academic success, which includes how well the level of student health through adequate sleep and student perceptions in addressing current lectures and students' perspectives in connecting between his or her success in the world of education with the world of work or business later through the level of attendance in the classroom, readiness to complete each lecture assignment and focus in providing maximum effort in following the teaching and learning process at the university (Bakar et al., 2010; Garkaz et al., 2011; Thawabieh, 2016). According to Suhaily and Soelasih (2015), family conditions (both in terms of quantity and quality) play a role in determining the academic success of students, which includes how many children in a student's family support or disrupt student concentration in pursuing lectures, economic level and background education of student parents in providing financial and educational support, closeness and involvement of student parents who act as personal counselors in listening to problems, giving advice and encouraging and harmonious relationships between parents as a positive atmosphere in the student family environment (Singh et al., 2016).

According to Suhaily and Soelasih (2015), the atmosphere of the university (both physically and psychologically) influences the academic success of its students, which includes the availability and condition of university facilities and infrastructure (buildings, elevators, classrooms, air conditioners, etc.) in providing comfort in the campus environment, the university's good name in providing pride for students, as well as the number of students and interactions with classmates in providing comfort while attending class (Mushtaq and Khan, 2012). According to Suhaily and Soelasih (2015), the competency of hard skills and soft skills held by lecturers as educators determines student academic success, which includes the readiness of lecturers in preparing and delivering lecture material so that students can understand what is explained by lecturers accompanied by the use of helping devices that support and comfort students in concentrating while in the classroom, the positive attitude of the lecturer toward students shown by the ability of lecturers to maintain good relations with students and create interactive classes, as well as qualified classroom management that is seen from the mastery of lecturers in creating student discipline while in class.

Academic advisors are regular lecturers assigned by the study program in providing academic services to the advisee students they support. They are likened to "parents on campus" for their advisee students. Academic advisors play a role in providing academic

direction and advice, including discussions in dealing with personal problems faced by their advisee students, especially those related to their college life while on campus and the surrounding environment. The study program has a policy that there must be at least four times face-to-face meetings between academic advisors and their advisee students, each of which includes future study plans, online advising, DKBS signature (Study Load Contract Documents) and ongoing study evaluations and discussion. The academic advisor plays a role in providing academic advising to the students he or she teaches, he or she acts like a mentor. Mentoring is a guidance process, in which a person, who has more qualified skills and experience, acts as a role-model, lecturer or teacher, sponsor, motivator, counselor and friend with the aim of enhancing and developing the personal development and professionalism of others who do not have experience (Demir *et al.*, 2014). Mentoring is a means of providing visionary support, motivation and feedback to students (Demir *et al.*, 2014). Mentoring has a positive impact on students' ability to deal with stress during study and their success in completing their education at the university (Demir *et al.*, 2014). Students highly value academic advisors who are easy to meet or contact, are friendly, and help in providing direction in connecting their academic experience with future life plans (Muola *et al.*, 2011; Ismail and Jui, 2014).

The research model is presented in Figure 1 below.

The figure shows that there are five factors (either internal or external) contribute to academic achievement and retention of student. Based on literature reviews conducted by researchers, here are 10 hypotheses derived from theoretical paradigm and empirical studies:

H1. Student has positive impact on academic achievement.

H2. Family has positive impact on academic achievement.

H3. University has positive impact on academic achievement.

H4. Lecturer has positive impact on academic achievement.

H5. Academic advisor has positive impact on academic achievement.

H6. Student has positive impact on student retention.

H7. Family has positive impact on student retention.

H8. University has positive impact on student retention.

H9. Lecturer has positive impact on student retention.

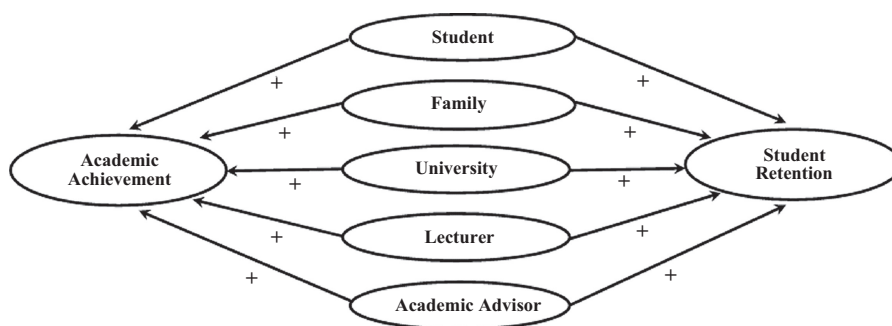*H10.* Academic advisor has positive impact on student retention.

Figure 1.
Research model

Source(s): Processed from many sources

The first five hypotheses describe positive influence of several factors toward student academic achievement while another last five hypotheses describe positive influence of several factors toward student retention rate. The directions of those hypotheses are positive; meaning the higher quality or intensity of those factors, the higher students' academic performance and their retention at the university.

3. Research methodology

The population in this study was all active students of a university in Indonesia at the time of the study, which was estimated at around 7,000 people. By using an alpha level of 10% and referring to the Harry King Nomogram (Hair *et al.*, 2009), the number of samples taken should be 261 people. To be more representative, by considering that the university which was the object of this study consisted of nine faculties and 27 study programs, the researchers doubled the number by 2.5 times. The researcher will use 700 (rounding up of 652.5) university students as respondents in this study. The sampling procedure that will be used in this study is simple random sampling. Simple random sampling is a sampling technique that is carried out randomly and simply, which method is used so that each respondent has an equal chance of being selected (Cooper and Schindler, 2011).

This research is a causal explanatory research. This study examines the effect of each of the five independent variables (student, family, university, lecturer and academic advisor) on academic achievement and student retention separately. The method to be used to carry out this test is multiple linear regressions, which is an analysis of the effect (cause–effect) of more than one independent variable on a dependent variable (Neuman, 2014). In order to get decent and precise results, researchers conducted a series of analytical methods on research instruments and data, which included testing validity and reliability, normality, heteroscedasticity and outliers (if needed).

Physical and psychological conditions of students were measured using nine items of question translated from a questionnaire that was used by Suhaily and Soelasih (2015) with a Cronbach's alpha reliability value of 0.684 and a confirmatory factor analysis (CFA) loading factor value ranging from 0.430 to 0.617. The quantity and quality of student families is measured using four items of question that have been used by Suhaily and Soelasih (2015) with a Cronbach's alpha reliability value of 0.601 and a CFA loading factor value ranging from 0.473 to 0.562. The quality of university facilities and infrastructure was measured using 5 items of question that had been used by Suhaily and Soelasih (2015) with a Cronbach's alpha reliability value of 0.679 and a CFA loading factor value ranging from 0.604 to 0.724. Lecturer hard skills and soft skills were measured using 7 items of question that had been used by Suhaily and Soelasih (2015) with a Cronbach's alpha reliability value of 0.718 and a CFA loading factor value ranging from 0.429 to 0.686. The quality of academic advisors was measured using 12 items of question of student assessment of academic advising instruments (advisor assessment instruments) used by Miller and Irons (2014). The scale used for the five independent variables and 37 question indicator items is a Likert scale consisting of 1 (strongly disagree) to 4 (strongly agree). The level of student academic achievement is measured by the magnitude of the GPA achieved by students as respondents at the time of the study. The GPA is in the range of 0.00–4.00. The retention rate of students from each study program is measured by comparing the number of students who are still active in a lecture (actual) in a period with the number of students who should be (ideally) still active.

4. Data analysis and results

Researchers have conducted a survey through the distribution of question questionnaires to 713 students studying at University X (100% response rate). They came from 17 study

programs under the auspices of the university which were the object of this research. Based on the results of the descriptive analysis, respondents in this study were dominated by women (55.3%), aged between 18 to 20 years (57.9%), only students (87.4%) from the city where the university was (63.7%), reside at home with family (56.2%), have a complete family (92.1%) and are not active in organizational activities at the university (58.9%) and GPA ranges from 2.76 to 3.50 (46.6%).

The results of reliability testing using Cronbach's alpha coefficient are presented in Table 1 below.

The table shows that almost all items (as many as 34 items) have good reliability, with values ranging from 0.770 to 0.963 (more than 0.6).

The results of normality testing using the Kolomogrov–Smirnov's test are presented in Table 2 below.

The table shows that the research data that have proven their normality because they have significance value above 10%, which is equal to 0.664. Because the research data are proven normal, testing of outliers is not necessary.

The results of multicollinearity testing, using the variance in factor (VIF) and tolerance values are presented in Table 3 below.

The table shows that the research data collected has met the criteria for multi-collinearity because it has a tolerance value exceeding 0.10 (ranging from 0.815 to 0.496) and a VIF value of less than 10 (ranging from 1.227 to 2.016).

Heteroscedasticity test ensures that dependent variables exhibit equal levels of variance across the range of those variables (Hair et al., 2009). The results of heteroscedasticity testing, using Glejser method, are presented in Table 4 below.

The table shows that the research data collected has met the criteria for heteroscedasticity because more than a half of independent variables have significant value more than 10%, ranging from 0.169 to 0.417, pertaining of linear regression analysis of those independent variables and absolute residual value (abs).

For the first test, the researcher conducted a multiple linear regression analysis between five independent variables with GPA as the dependent variable, with the results presented in Table 5 below.

The table above shows that there are two proven research hypotheses, which have a significant positive effect (beta value of 0.248 with significance value of 0.000) on academic achievement of student and lecturer significantly positive effect on student academic achievement (beta value of 0.015 with significance value of 0.080) at an alpha level of 10%.

For the second test, the researcher conducted a multiple linear regression analysis between five independent variables with the student retention rate as the dependent variable, with the results presented in Table 6 below.

The table above shows that there is a proven research hypothesis, which has a positive effect on student retention rate (beta value of 1.536 with significance value of 0.070) at an alpha level of 10%.

Variable	Cronbach's alpha	Number of items
Student	0.770	7
Family	0.796	4
University	0.774	5
Lecturer	0.895	7
Academic advisor	0.963	11
Source(s): Processed research data (2019)		

Table 1.
Reliability test results

		Unstandardized residual
N		713
Normal parameters[a,b]	Mean	OE-7
	Standard deviation	0.32109290
Most extreme differences	Absolute	0.027
	Positive	0.027
	Negative	−0.016
Kolmogorov–Smirnov Z test		0.728
Asymp. sig. (two-tailed)		0.664

Table 2.
Normality test results

Note(s): (a) test distribution is normal; (b) calculated from data
Source(s): Processed research data (2019)

Coefficients[a]

		Collinearity statistics	
Model		Tolerance	VIF
1	Student	0.734	1.363
	Family	0.815	1.227
	University	0.544	1.837
	Lecturer	0.496	2.016
	Academic advisor	0.812	1.231

Table 3.
Multi-collinearity test results

Note(s): [a]Dependent variable: GPA
Source(s): Processed research data (2019)

Coefficients[a]

		Unstandardized coefficients		Standardized coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	0.340	0.132		2.579	0.010
	Student	−0.004	0.005	−0.035	−0.812	0.417
	Family	0.002	0.007	0.009	0.221	0.825
	University	0.010	0.007	0.070	1.375	0.169
	Lecturer	−0.009	0.006	-0.090	−1.703	0.089
	Academic advisor	0.006	0.002	0.108	2.600	0.010

Table 4.
Heteroscedasticity test results

Note(s): [a]Dependent variable: ABS
Source(s): Processed research data (2019)

5. Research implications

The results of this study are in line with the previous studies conducted by Thawabieh (2016), Singh *et al.*, (2016), Suhaily and Soelasih (2015), Ayuni and Mulyana (2015), Garkaz *et al.*, (2011) and Bakar *et al.* (2010). Student academic achievement is determined by the personal intention of the student and the quality of the lecturers. Every study program at university should provide formal training programs or informal appeals to its lecturers (including academic advisors) so that they pay more attention to the students who are taught and mentored by them. Every lecturer (in every class meeting) and academic advisor (in every interaction, both through face to face and various forms of electronic communication media available) need to instill awareness so that students can better manage themselves in totality.

Coefficients[a]					
	Unstandardized coefficients		Standardized coefficients		
Model	B	Std. Error	Beta	t	Sig.
1 (Constant)	2.715	0.209		12.999	0.000
Student	0.047	0.008	0.248	5.831	0.000
Family	−0.004	0.011	−0.016	−0.398	0.691
University	−0.034	0.011	−0.148	−2.990	0.003
Lecturer	0.015	0.009	0.091	1.755	0.080
Academic Advisor	−0.010	0.004	−0.103	−2.558	0.011

Note(s): [a]Dependent variable: GPA
Source(s): Processed research data (2019)

Table 5.
Results of regression
analysis I

Coefficients[a]					
	Unstandardized coefficients		Standardized coefficients		
Model	B	Std. Error	Beta	t	Sig.
1 (Constant)	1.260	0.344		3.662	0.004
Student	−0.051	0.090	−0.206	−0.566	0.582
Family	−0.033	0.075	−0.210	−0.437	0.671
University	−0.105	0.092	−0.537	−1.146	0.276
Lecturer	0.232	0.116	1.536	2.010	0.070
Academic advisor	−0.131	0.080	−0.827	−1.642	0.129

Note(s): [a]Dependent variable: student retention rate
Source(s): Processed research data (2019)

Table 6.
Results of regression
analysis II

Each teaching staff members and academic advisor should continuously educate students so that they are able to have regular physical activities, such as sleeping, eating and exercising routinely. To balance this out, each teaching staff members and academic advisor should also demonstrate exemplary behavior to students so that they can show positive attitudes and behaviors, such as discipline, initiative, independence and involvement in student activities in the campus environment. Lecturers at the university have the responsibility as "second parents" in directing and shaping the personalities of their students who are willing and able to apply moral and spiritual values through management and self-leadership in the life of study that are aligned with their academic achievements.

The level of student retention is determined by the quality of the lecturers. Each study program at the university should provide a self-development program for its lecturers so that they become human resources that provide qualified teaching, ranging from planning student-centered lecture systems, organizing media diversity and the methods used during the teaching and learning process in the classroom, leadership role models and co-learners in which students are able to apply what they get from the presentation of the material and the behavior of their lecturers, as well as controlling the harmonious relationship among lecturers and students. The lecturer is a figure who becomes an encouragement for students in their diligence in carrying out to accomplish their study. The quality of lecturers is one of the considerations of students in committing to their universities. Each lecturer is a frontline employee at the university. They conduct intensive direct interaction with their students. Such conditions reinforce the fact that the decision of students to continue their studies at the university is largely determined by their perceptual assessment of their lecturers, ranging from aspects of knowledge and experience of interpersonal skills.

6. Limitations

Research that has been done is inseparable from several limitations. This study only involved five independent variables that were predicted empirically had an influence on the level of academic achievement and student retention. The researcher suggests that future research should involve more endogenous variables in order to be able to get a more comprehensive picture of the data. In testing its hypothesis, this study uses linear multiple regression analysis to examine the causal relationship between five independent variables and two dependent variables. The researcher suggests that future research should use a more dynamic research model, such as including moderation or mediation variables in its processing using more diverse methods, such as ANOVA or path analysis. Because of access constraints, this research has not yet reached all students of each study program. Researchers suggest that future research should involve all students who are studying in each study program chosen at a university. Moreover, this quantitative study conducted at a private university, therefore this research results cannot be generalized on every university. Researchers suggest that future research should involve more universities, including public and open universities, to expand and strengthen the applicability range of research's results.

7. Conclusion

Academic achievement and student retention are two important indicators that show the excellence of a university. University academic achievement is determined more by the intrinsic motivation of its students. The enthusiasm in students at the university is a trigger for their determination and persistence in achieving themselves in the field of education as a form of self-actualization on the campus where they work. The retention of students is more determined by the extrinsic motivation that sources from the campus environment they are in. The professionalism of lecturers at the university is a reason that affirms the desire of students to complete their education at the university. Researchers hope that the university (synergy with all study programs) regularly conducts an active review of the quality of its lecturers and students. It is not only evaluating but it is also hoped that they will take proactive actions in improving and maintaining the motivation of each teaching staff and their students so that they are willing and able to try to provide the best for the progress of their university. Furthermore, the wind of change is coming faster than its prediction; globalization and digitalization are more real. Open universities are not the specific type of universities any longer, but they have become the future trend of universities all around the world. Hopefully, the tertiary education government can proactively provide any necessary supports and inspire every university to prepare and develop every resource needed to adopt the system that an open university has in the life of its college community. Thus, every university is living in the digital space of higher education ecosystem. The success of each element of the university citizens determines the continuation of the university.

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