Enhancing Student's Competitive advantage in Technology Based University

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Abstract. The research was aimed at investigating competitive advantage of students in technology-based university and to what extent their competitive advantage can be enhanced. The research was performed through a case study in a private university in Bandung, which applies bases of technology in almost all activities of learning and administration. The methodology used was quantitative method by implementing validity test, reliability tests, and simple linear regression to analyze the percentage of relationship between Student Competitive Advantage and Technology Based University. Data collection was conducted by spreading questionnaires on 261 respondents and was rated with Likert Scale. Data retrieval from related division, interview, and literature review were also performed for additional data. The finding of the result has led to the significance of student's competitive advantage in Technology based university. It means the application of technology is a major factor in winning the competition in field of global education. The findings contribute in providing recommendation for building technology-based university and shifting university management from conventional to technology-based university.

1. Introduction

Competitive strategy is the way to find sustainable and profitable position in the competition [1]. Since there is high competition among HEI, building competitive advantage of the students through technology application is very important. Indeed, it is becoming the major factor to determine the success of HEI [2]. Education have to focus to enhance skills of the students as the part of competitive advantage. This means that the students should have accountability, critical thinking skills, and rationale in making the decision. [3]. In the meantime, information technology revolution creates competitive advantage by giving new ways to outperform their rivals [4]. Technology application is the source of competitive advantage and organizational learning which relate to system adaption or change [5]. Therefore, the student's competitive advantage (SCA) has been predicted to have strong relations to technology-based university (ITU) and therefore become an interesting issue to be researched.

Many prior studies discussed about the competitive advantage. The research of P. Ghemawat and J. W. Rifkin (2006) indicated that a firm can reach its competitive advantage by creating something unique and valuable. However, the research only highlighted the creation of competitive advantage in general, not in the specific term of technology application [6]. Other research studied competitive advantage in the industrial fields and commercial firms [7,8,9]. Unfortunately, not many researches talked about the competitive advantage linked with the university. A prior research by L. Lam and S. Hayduk (2003) studied about competitive advantage in educational institutions. However, the research described about the broader concept of competitive advantage in the areas of service quality,

customer satisfaction, and behavioral intentions not in terms of the students [10]. The measurement of student's competitive advantage from the technology application side has not yet been mentioned in this research.

Since the most prior researches in the competitive advantage stated that the essence of creating advantage is finding and setting something different from its rivals, the research with more specific terms is needed to confirm it. Additionally, many previous researches described competitive advantage in terms of price, product, system, etc. [7, 11, 12]. Only few researches explained about competitive advantage on human resource, especially on the students. Concerning to that, the purposes of this research are to investigate ways to enhance student's competitive advantage and to what extent their competitive advantage by technology application in the University can be enhanced. The research was conducted in a private university in Bandung, Universitas Komputer Indonesia as the case study. The quantitative method was used to discover the precise number. The methods used were validity test, reliability tests, and simple linear regression in order to find the percentage within the relations between ITU and SCA.

2. Experimental Method

The case study was performed in this research by spreading the questionnaire from 261 respondents in Universitas Komputer Indonesia. The questionnaire was distributed on Entrepreneurship Class on August 16, 2018. The questionnaire covered 21 statements representing each measured indicator and were assessed based on the Likert Scale [13]. Validity test, reliability tests, and simple linear regression using IBM Statistical Social Science Program (SPSS) 20 were performed to know the extent of student's competitive advantage enhanced in the technology-based university. Additionally, interview with entrepreneurship lecturers and collection of related reports/documents were conducted for completing the data analysis. The hypothesis in the research suggested that technology application has significant influence to the student's competitive advantage.

Figure 1 describes analysis model in which student's competitive advantage (SCA) as dependent variable and technology-based university (ITU) as the independent variables. The research was done on two indicators of technology application in the university. First, technology application in terms of administration service/e-service (ES) and second, in terms of e-learning/on-line system (EL). The indicators of SCA covered Basic skills (BS), Acquired Skills (AS), College Accomplishment (CA), and Time management (TM) [3]. Sub indicators of ES were web information quality, web interaction quality, reliability, responsiveness, and assurance [14]. Sub indicators of EL were non-linearity, feedback interactivity, Just in Time, Easy Accessibility, and Collaborative Learning [15].
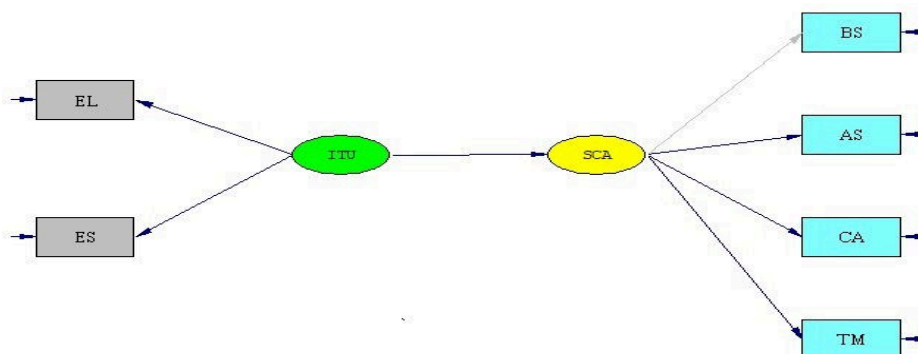

Figure 1. Analysis Model

Sub indicators for BS covered initiative, teamwork, and personal selling skill. Sub indicators AS covered problem-solving skills, written communication, Computer skills, and decision-making skills. Sub indicator of CA covered High GPA and Foreign language. Sub indicator of TM covered Time management and scale priority [3].

The calculation of the coefficient correlation of Pearson should be performed for validity testing stage using the following formula:

$$r_{xy} = \frac{n(\sum XY) - (\sum X).(\sum Y)}{\sqrt{\{n\sum X2 - (\sum X)2\}.\{n\sum Y2 - (\sum Y)2\}}}$$

rxy is the coefficient correlation, X is the total item score, and Y is the amount of total score (all of the item). Then, the criteria for decision-making in testing validity are: (1) If r count > r table, then the statement is valid (2) If r count < r table, then the statement is invalid; in which the critical value of Pearson is 0, 197. [16].

Furthermore, reliability testing (reliability level of the questionnaire) is calculated by using Cronbach Alpha

formula [16, 17]: $-\left(\frac{k}{k-1}\right)\left(1 - \frac{\sum \sigma_b^2}{\sigma_t^2}\right)$ where ri is the reliability instruments, k is the number of questions, $\sum \sigma b2$ is the number of grain variants, and σt2 is the total variant. Criteria for decision making in reliability testing are defined if the instrument has a reliability coefficient of ≥ 0.6 [16]. Based on the results of data processing, the reliability value obtained for ITU is 0.790 and for SCA is 0.899, which exceeds the reliability coefficient of 0.6, so the statement is included in the category of reliable [16].

3. Results and Discussion

Table 1. Result of Validity and Reliability Test

Variables	Indicators	Validity	Reliability
IT-based University	E-Learning	0.914	0.790
	E-Service	0.905	
Student's Competitive Advantage	Basic Skills	0.917	0.899
	Acquired Skills	0.924	
	College Accomplishment	0.909	
	Time Management	0.872	

Table 2 showed that the relations between ITU and SCA 0.782 was categorized in the strong relations. The influence ITU toward SCA is 61.2 %.

Table 2. Summary of Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.782[a]	.612	.610	4.78016

a. Predictors: (Constant), ITU

Table 3. Result of Regression Test

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.146	1.773		.082	.934
	ITU	1.184	.064	.782	18.384	.000

a. Dependent Variable: SCA

Regression equation: Y = 0.146 + 1.184 X1
T count 18.384
T table 1.971
T count >T table, the conclusion is ITU has a strong influence toward SCA

The research on the student's competitive advantage is a new perspective of the competitive advantage concept. Competitive advantage used in analyzing the perspective of firms operational covers several dimensions such as: Price/cost, quality, delivery dependability, product innovation, and time to market [18]. C.K Prahalad and Gay Hamel stated that competitive advantage not only lies in the product or service differentiation but also lies more on the disciplined and characters of people [19]. The facts saying that recent student's competitive advantage is becoming more crucial in the competitive world and the digital era. This significantly brings massive influence to all aspect of human's life, and therefore has made this research more relevant to be performed.

As shown in Table 1, IT-based University covers two aspects of technology application such as e-learning and e-service. Sub indicators of e-learning comprise Non-linearity, Feedback interactivity, Just in Time, Easy Accessibility, and Collaborative Learning. Non-linearity referring to the freedom to access learning objects, download lesson material, assignment from lecturers, information and the availability of e-learning facilities. Feedback interactivity refers to learning process that is performed interactively and feedback in the learning process. Just in time means as learning material, e-learning can be used anytime, can solve the problem, and can increase knowledge of the students. Easy Accessibility means the easiness to access the e-learning and its facilities. Collaborative learning means that the tools used in e-learning can create better communication between lecturer and student at the same or different time through e-learning user [15]. Additionally, e- service covers several sub indicators such as web information quality, web interaction quality, reliability, responsiveness, and assurance. Web information quality is defined as assessment of the costumers toward website information quality. Web interaction quality is defined as assessment of the costumers toward interactive website and ease of use. Reliability is defined as assessment of the costumer toward reliability of the system to perform service. Responsiveness is defined as assessment of the costumers toward system that can response and solve the problem effectively. Assurance means assessment of the costumers toward system service through security guarantee in all transaction process [20].

Table 1 showed that all data in the questionnaires are declared valid in which the critical value of Pearson is 0, 197. The r count on all statements showed that all r count > r table so that the data is declared valid [16]. Based on the results of data processing, the reliability value obtained for ITU is 0.790 and for SCA is 0.899, which exceeds the reliability coefficient of 0.6, so the statement is included in the category of reliable [16].

Table 2 showed that the relations between ITU and SCA is 0.782 and is categorized in the strong relations [21]. The influence ITU toward SCA is 61.2 %. For e-learning as one of the indicators in ITU, the finding of this research confirmed most of the previous finding, in a more specific area. The previous research indicated general positive relationships among the use of the learning technology and student's engagement, as well as the learning technology and the learning outcomes. Additionally, the results in the student engagement indicated that they have been more likely to enroll in online courses [21]. Learning process in the technology-based university usually refers to e-learning and online learning. Both terms are often used interchangeably; e-learning is a broader concept that covers any form of telecommunication and computer-based learning, whereas on-line learning has a more specific definition referring to the use of internet and web [22]. E-learning, as the indicator of ITU, has strong influence toward SCA. In addition, the statement of the European Commission (2001) suggests that e-learning is described as the use of new multimedia technologies and the Internet in order to increase learning quality by easing the access to facilities and services as well as distant exchanges and collaboration [24]. The increasing of learning quality and easing access to learning facilities such as lesson material and on-line references are predicted to give strong influences to SCA.

E-learning as one of the ITU indicators has influenced significantly on SCA that covers BS, AS, CA and TM. It means that the sub indicators of e-learning (Non-linearity, Feedback interactivity, Just in Time, Easy Accessibility, and Collaborative Learning) have also strong relation on the sub indicators of BS (initiative, teamwork, and personal selling skill), on the sub indicators of AS (problem solving skills, written communication, Computer skills, and decision-making skill), on the sub indicators of CA (High GPA and Foreign language), and on the sub indicators of TM (Time management and scale priority) [3].

This was in line with the result of prior research. Heinzen and Alberico (1990) claimed that the users of e-learning, especially through teleconferencing, could be used to enhance skill, motivation, and communication [25]. Another research investigating e-learning on dentistry students found that they likely to attend class with e-learning method [26]. Generally speaking, e-learning can be a positive experience. The world wide web, e-mail, and bulletin boards as the particular components of e-learning allow digital materials to be created, stored, accessed and interacted. There exists prior research indicating this as the reason of e-learning in having time flexibility as well as enhancing time management as one of the SCA indicators [27]. Another research claimed that the use of technology in learning is the ways to engage students, strengthen communication skills, incorporate skill development, and promote services available outside the classroom as well as help students to develop multiple skill sets in class [3].

As depicted in Table 2 and 3, another indicator of ITU; namely e-service (ES) also contributes significant influence in 61.5% relations between the ITU and SCA. It means that sub indicators of the ES (information quality, web interaction quality, reliability, responsiveness, and assurance) have strong relationship with the sub indicators of the SCA. ES in university includes online library, administration service, e-admission, etc. Information quality means that e-service in university contributes accurate, reliable, up to date, and easily understood information. Web interaction quality is defined as web effectivity, efficiency, user friendly website, and simple menu. Reliability means real time process, accurate, minimized mistakes, easy access, and usable anytime. Responsiveness means fast response and effective, at the same time it provides problem solving solution. Assurance means the existence of protected password, website security, and availability of call center [28]. Not so many literatures discussed the issue concerning relationship between ES and SCA because most previous studies describe about ES in the commercial company, rather than in the university.

A few literatures discussed about e-service linking with the time management as one of the SCA indicators. Ward and Peppard (2002) said that the main target of Information technology application are resource efficiency, effectiveness, and enrichment. Resource efficiency leads more to efficiency and time management. This has strong relations to the agility to gain the maximum achievement. Effectiveness leads to clear focus for that achievement. Meanwhile, enrichment refers to progress, improvement, and adaptability to face changing environment and raises the learning as well [29]. This factor was strongly predicted to have relations with the SCA. In addition, e-service also includes self-service technology. For example, the student can make their personal self-service in the registration as well as find the information about the score, questionnaires, and examinations. The self-service technology increases the SCA, especially in terms of problem solving as well as initiatives [30]. The easiness to find literatures in online library in ITU can enrich the knowledge of the student, thus it can increase SCA's basic skills, acquired skills, college achievement, and time management as well.

4. Conclusion

From all the depicted tables and figures, it is obvious that the technology application in university can enhance student's competitive advantages. The application of technology is a major factor in winning the competition in the global education field since the students become the core of university. Although we believe so, the student competitive advantage is still the challenge to be developed through the good management of IT system in university, both in e-learning and e-service. In additions, considerable investment to build the technology-based university was the most frequently mentioned drawback. Through this research, we believe this information may also be beneficial in providing recommendation to shift into ITU since it has a great influence on the SCA as the main objective of higher education itself. However, the limitation of this research is that all sub indicators was calculated as one unity of the indicator of SCA; as well as indicator of ITU. Future research should investigate the influence on each sub-indicator separately to make the description more specific and detailed.

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