

Technological Capabilities of A Higher Education Institution in Quezon Province: Basis for Organizational Competitiveness Framework

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Abstract

Technological advancement is consistently seen developing and evolving in such a fast phase which consequently brings challenges to several key players in the industry including that of the academe and higher education institutions - for which the same are thrusted to deliver quality education. With the everincreasing development of technology and its integration into an organization's systems and processes, a decision regarding its implementation and use is a challenge, more so on capabilities and opportunities brought about by these phenomena. One important consideration for a globally competitive higher education provider is technological transformation. Utilizing quantitative research design specifically applying descriptive-correlational approaches, the study dwelled on the technological capabilities of a Philippine higher education institution (HEI) located in the province of Quezon. A total of three hundred three (n=303) individuals consented to participate in the study. Furthermore, the imperatives on how higher education institutions can self-develop towards technological capacitation were explored, to support its mission and vision, and continue its delivery of teaching-learning amidst the volatility, uncertainty, complexity, and ambiguity of the education industry. Specifically, the dimensions of information and communication technology infrastructure, technology adoption, human capital, investment innovation in technology, and innovative technology environment were conceptualized as basic tenets of technological transformation. The impact of these dimensions on organizational competitiveness was measured using partial-least square structural equation modeling (PLS-SEM). The practical implications of this study are to contribute to the theory and practice of technology in education and fill the gaps in the limited literature resources on technology transformation in education, particularly in the province of Quezon.

Keywords: technological capability, organizational competitiveness, higher education institution, Quezon province

Introduction

With the ever-increasing development of technology and its integration into an organization's systems and processes, a decision regarding its implementation and use is a challenge, more so on capabilities and opportunities brought about by these phenomena. Higher education institutions have not seen a major paradigm shift in policy developments toward the enhancement of technological



capabilities - nor in research funding geared toward the same, in recent decades (Kruss, 2019). At the global level, higher education institutions may add to economic development via innovation – particularly in technological innovations. Using these concepts, this paper examines how well KLM University is positioned to contribute to economic development, using its technological readiness and practices, and more so on integrating technology into its systems and procedures. It is argued that this approach offers a way forward for institution's digitization initiatives - as an antecedent of organizational competitiveness.

The unexpected onset of the COVID-19 pandemic has aggravated these academic disruptions – in which educational institutions switched to technology-based teaching and learning from the conventional modality (Garcia-Morales, 2021). The same study by Oke implicated mutual relationships between the education sector and technological innovations. Higher education institutions have the opportunity to leverage themselves by using technology in their delivery of teaching-learning, which may require a significant shift from doing things conventionally to doing things amidst the Industrial Revolution 5.0.

Furthermore, the pandemic has brought massive disturbances in the delivery of teaching-learning in the education industry (Krishnamurthy, 2020). To mitigate the effect of the pandemic and the spread of the virus, governmental policymakers around the globe have imposed social distancing measures, lockdowns, and stoppage of face-to-face contacts; resulting immediately in a complete transfer to online classes from the conventional on-ground cases (Mishra et al., 2020).

This study explored the imperatives on how higher education institutions can self-develop towards technological capacitation, to support their mission and vision, and continue their delivery of teaching-learning amidst the volatility, uncertainty, complexity, and ambiguity of the education industry. Specifically, this study focuses on information technology infrastructure, technology adoption, human capital, basic human, ease of doing business, investment innovation in technology, and innovative technology environment as basic tenets of technological transformation. The practical implications of this study are to contribute to the theory and practice of technology in education and fill the gaps of the limited literature resources on technology transformation in education, particularly in the province of Quezon.

Objectives of the Study

The main objective of the study is to assess the technological capabilities of a local higher education institution in the Philippines along the sub-dimensions of IT infrastructure, technology adoption, human capital, innovation technology, and innovation environment. The study will also measure the impact of technological capabilities on organizational competitiveness as a basis for developing a framework.

Methodology

This study utilized a quantitative research design in general, specifically applying both descriptive survey and correlational approaches. The descriptive survey is used to explore the phenomena of technological capabilities (TC) and organizational competitiveness (OC) of a Philippine higher education institution — in which the subdimensions of TC are namely, information technology infrastructure, technology adoption, human capital, ease of doing business, investment innovation in technology, and innovative technology environment; and the sub-dimensions of organizational competitiveness are



institutional performance and economic performance. The purpose of a descriptive research design is to describe individuals, events, and situations/phenomena by studying them as they are in its normal and current conditions (Siedlecki, 2020).

Additionally, the correlational approach is used to determine the influence of technological capabilities on organizational competitiveness. Seeram in 2019 defined correlational studies as a research design of a non-experimental type that facilitates the prediction and explanation of relationships among variables.

The target respondents are the non-teaching (N1= 221) and teaching (N2 = 284) staff of the subject higher education institution; in which the total population is five hundred five (N = 505). Using G-Power to determine the appropriate sample size (Kang, 2021) with a 0.05 level of significance, a total of three hundred-three samples (n = 303; n1 = 155; n2 = 148) were computed.

Table 1
Respondents of the study

| Responaents of the study | | | |
|--------------------------|---------------------------|-------------------------------|--|
| Strata | Population of the Stratum | Sample Size Pere Stratum (n = | |
| | (N = 505) | 303) | |
| Non-Teaching | 221 | 155 | |
| Teaching | 284 | 148 | |

The research instrument is a researcher-made questionnaire based on reviewed literature and scoping which was made via a focus group discussion. The researcher-made questionnaire is validated by the research adviser and three experts in the focus of research. Additionally, the questionnaire underwent a pilot test on 15 non-target respondents and returned a computed Cronbach's alpha of .893 which is higher than the threshold value of 0.750 establishing the internal consistency of the instrument (deBarros, 2020).

Based on the related literature readings and the theoretical framework, this initial conceptual framework is conceptualized.

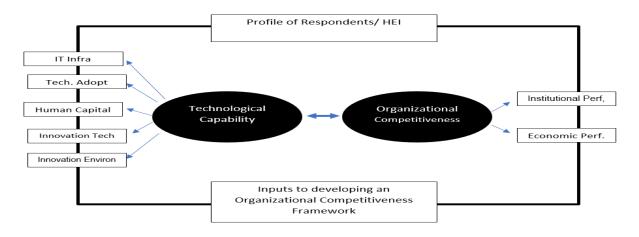


Figure 1. Profile of the Respondents

Considered vital in the conduct of the study is the determination of the extent of technological capability of the subject HEI; which will be measured via its subdimension of information technology



infrastructure, technology adoption, human capital, innovation technology investment, and innovation technology environment. Equally important is determining the level of organizational competitiveness; which is an antecedent of institutional and economic performances. The impact of technological capability on organizational competitiveness is measured using multiple regression analysis. The results of the study are made as bases for developing the framework of Organization Competitiveness.

Results and Discussions

1. Technological Capabilities

1.1. In terms of Information Technology Infrastructure

Table 2

Technological Capability in terms of Information Technology Infrastructure

| Indicators | Weighted | Standard | Verbal Description |
|--|----------|---------------------|-----------------------------|
| The institution is technology capable with respect to IT | Mean | Deviation | |
| infrastructure, as | | | |
| Enough number of computers are provided to each and every unit/personnel of the institution. | 4.0726 | .66108 | Capable to a Much Extent |
| Reliable interconnectivity of computer terminals is in placed all throughout the institution. | 3.8713 | .49155 | Capable to a Much Extent |
| The institution is subscribed to reliable internet provider/s. | 3.7901 | .68668 | Capable to a Much Extent |
| Appropriate soft-wares and applications are installed according to the needs of the end-user; keeping in mind quality provisions of teaching-learning. | 3.8284 | .64355 | Capable to a Much Extent |
| Appropriate computer accessories are provided ensuring the smooth day-to-day work and teaching transactions. | 3.8680 | .69701 | Capable to a Much Extent |
| There is an active website that promotes the vision, mission, and goals of the HEI | 3.9901 | .62235 | Capable to a Much Extent |
| Technical support is available 24/7 | 3.9010 | .59532 | Capable to a Much Extent |
| General Weighted Mean 3.9031 (Capable | | e to a Much Extent) | |

The analysis of data revealed that the indicator "the institution is a technology capable as appropriate number of computers are provided to every unit/personnel of the institution" was rated highest by the respondents with a weighted mean of 4.0726 (SD = .66108) which is interpreted as "capable to a much extent". The least rated indicator is "the institution is subscribed to a reliable internet provider" with a weighted mean of 3.7901 (SD = .68668) which is interpreted as "capable to a much extent". Overall, the subjected higher education institution is perceived by respondents to be technologically capable concerning technology infrastructure to a "much extent" with a general weighted mean of 3.9031.

The articles of Szymkowiak in 2021 and Lee in 2020 posited the paramount importance of information technology infrastructure in ensuring the technological capability of higher education in achieving digital campus status, and more so on the university's goal towards internationalization. The enhancement of information technology infrastructures is confirmed as a factor in the attainment of academic strategic objectives (Salehi et al, 2019) – and the promotion of institutional vision, mission, and goals. Empirical evidence supports that information technology infrastructure impacts organizational performance (Huang et al, 2022). Information technology infrastructure positively promotes a firm's



performance, including monetary and non-monetary performances (Huang, 2022; Ongeri, 2020; Benavidez, 2020; Kiebritchi, 2018).

1.2. In terms of Technology Adoption

 Table 3

 Technological Capability in terms of Technology Adoption

| Indicators | Weighted | Standard | Verbal Description |
|--|----------|------------|----------------------------------|
| The institution is technology capable with respect to technology adoption, | Mean | Deviation | |
| as | | | |
| There is an institution-wide use of a standardized integrated syllabi. | 4.0891 | .57714 | Capable to a Much Extent |
| E-Learning resources (e.g. NEO-LMS, e-books and e-journals) are available and are integrated in the delivery of teaching-learning processes. | 4.1564 | .52926 | Capable to a Much Extent |
| Staff, both non-teaching and teaching, attend continuing education and skills enhancement on regular basis which is fully supported by the HEI | 4.4578 | .65007 | Capable to a Very Much Extent |
| There is a customized course module and e-materials assuring the quality teaching-learning. | 4.0112 | .63162 | Capable to a Very Much Extent |
| All course modules related to teaching-learning can be accessed online | 3.9720 | .65485 | Capable to a Much Extent |
| Video-conferencing is available as a means of learning activities | 3.7309 | .72613 | Capable to a Much Extent |
| All educational resources are properly maintained and updated regularly | 4.3300 | .89701 | Capable to a Very Much Extent |
| General Weighted Mean | 4.1067 | (Capable t | o a Much Extent) |

The analysis of data revealed that the indicator "the institution is the technology capable as staff, both non-teaching and teaching, attend continuing education and skills enhancement on regular basis which is fully supported by the HEI" was rated highest by the respondents with a weighted mean of 4.4578 (SD = .65007) which is interpreted as "capable to a very much extent". The least rated indicator is "video-conferencing is available as a means of communication and learning activities" with a weighted mean of 3.7309 (SD = .72613) which is interpreted as "capable to a much extent". Overall, the subjected higher education institution is perceived by respondents to be technologically capable with respect to technology adoption to a "much extent" with a general weighted mean of 4.1067.

In a study by Teo et al in 2019, the propensity of Spanish and Chinese university teachers to technology adoption and how it impacts institutional sustainability were explored. The subjects of the study completed a research instrument based on Hofstede's cultural dimensions which included individualism, avoidance, and constraints among others. The study revealed that there is a significant positive relationship between technology adoption and institutional sustainability.

1.3. In terms of Human Resources

The analysis of data revealed that the indicator "the institution is a technology capable as regular training/workshops are in-place all throughout the organization towards the uplifting to staff's technological skills" was rated highest by the respondents with a weighted mean of 4.3248 (SD = .67492) which is interpreted as "capable to a very much extent". The least rated indicator is "Employees can perform basic work-related technology troubleshooting" with a weighted mean of 4.0069 (SD = .71977) which is interpreted as "capable to a much extent". Overall, the subjected higher education institution is



perceived by respondents to be technologically capable concerning human resources infrastructure to a "much extent" with a general weighted mean of 4.1857.

Table 3

Technological Capability in terms of Human Resources

| Indicators | Weighted | Standard | Verbal Description |
|--|----------|-----------|-----------------------|
| The institution is technology capable with respect to human | Mean | Deviation | |
| resources, as | | | |
| All staff are supported to develop work-related technological skills | 4.2149 | .65022 | Capable to a Very |
| via continuing education | | | Much Extent |
| Staff are technology-know-how equipped through participation | 4.1587 | .63880 | Capable to a Much |
| and attendance to outside training workshops | | | Extent |
| Regular training/workshops are in-place all throughout the | 4.3248 | .67492 | Capable to a Very |
| organization towards the uplifting to staff's technological skills | | | Much Extent |
| Employees are multi-tasked to perform a variety of e-transactions | 4.1512 | .76114 | Capable to a Much |
| ensuring continuous service provisions | | | Extent |
| Technology skills is a basic hiring requirement for all types of | 4.1630 | .92082 | Capable to a Much |
| positions | | | Extent |
| Employees can perform basic work-related technology trouble | 4.0069 | .71977 | Capable to a Much |
| shooting | | | Extent |
| Organizational human capital have positive attitude towards the | 4.2805 | .70277 | Capable to a Much |
| integration of technology in all work-related functions | | | Extent |
| General Weighted Mean | 4.1857 | (Capa | ble to a Much Extent) |

A capable human resource infrastructure is a vital component of better business performance as posited by Fenech et. al (2022). The changing role of employees or human resources in general in the era of Industrial Revolution 4.0 ensures business processes and operations are apt to quality standards – thereby justifying the development of technologically skilled and technologically capable employees. Scholarly articles by Broadbent (2021), Chanopas (2019), and Granic (2019) postulated that investing in human resources – via skills and professional development – impacts the economic aspect of organizational sustainability.

1.4. In terms of Investment Innovation in Technology

Table 4

Technological Capability in terms of Investment Innovation in Technology

| Indicators | Weighted | Standard | Verbal Description |
|---|----------|-----------|----------------------------------|
| The institution is technology capable with respect to investment | Mean | Deviation | |
| innovation in technology, as | | | |
| The top executives of the HEI support technology and digitization initiatives | 4.2257 | .61461 | Capable to a Very Much Extent |
| Third party technology supplier/vendor are enjoined to participate in all organizational-wide technology initiatives as partners | 3.7192 | .65925 | Capable to a Much Extent |
| The HEI offers subsidized training/workshops to interested employees and students to enhance their technological skills using in-house technological facilities | 4.1947 | .75360 | Capable to a Very Much Extent |
| The HEI offers training-workshops to outside stakeholders at a competitive rate, using in-house technological facilities. | 4.1528 | .83221 | Capable to a Very Much Extent |
| Procurement of technology-related equipment/materials/soft-wares undergo a stringent process to ensure the need for it, and fair cost. | 4.0267 | .55984 | Capable to a Much Extent |
| The HEI's investment in technology covers the appropriate provision of teaching and learning. | 4.0024 | .66465 | Capable to a Much Extent |
| The HEI's investment in technology covers the appropriate delivery of all administrative-financial related functions of the organization | 3.7855 | .73479 | Capable to a Very Much Extent |
| General Weighted Mean | 4.0153 | (C | apable to a Much Extent) |



The analysis of data revealed that the indicator "the institution is technology capable as top executives of the HEI support technology and digitization initiatives" was rated highest by the respondents with a weighted mean of 4.2257 (SD = .61461) which is interpreted as "capable to a very much extent". The least rated indicator is "third party technology supplier/vendor are enjoined to participate in all organizational-wide technology initiatives as partners" with a weighted mean of 3.7192 (SD = .65925) which is interpreted as "capable to a much extent". Overall, the subjected higher education institution is perceived by respondents to be technologically capable of investment innovation in technology to a "much extent" with a general weighted mean of 4.0153.

Investment innovation in technology as a dimension of technological capability contributes to institutional sustainability and adds a premium to its goods and services (Massoro, 2022). Moreover, in an article by Marinomi (2020), the enhancement of technological infrastructures and rewriting of technological procedures and processes should be viewed as an investment in the long term. The effects of investment innovation in technology on business sustainability, particularly on small and medium enterprises (SMEs), are found to have a significant positive impact on production and the delivery of services ((Hanaysha, 2021).

1.5. In terms of Innovative Technology Environment

Table 5
Technological Capability in terms of Innovative Technology Environment

| Indicators | Weighted | Standard | Verbal Description |
|---|----------|-----------|-----------------------|
| The institution is technology capable with respect to investment | Mean | Deviation | _ |
| innovation in technology, as | | | |
| Scheduling of commonly required student' transactions (e.g. class | 3.9505 | .75084 | Capable to a Much |
| scheduling, treasury services, registrar's services, and other | | | Extent |
| student-related services) are institutionalized. | | | |
| E-resources such as course modules and materials are | 4.0396 | .52590 | Capable to a Much |
| downloadable. | | | Extent |
| Class records are integrated with the LMS and overall learning- | 4.0858 | .56898 | Capable to a Very |
| teaching management systems. | | | Much Extent |
| Payment of fees can be done online | 4.2277 | .65039 | Capable to a Very |
| | | | Much Extent |
| Key HEI's performance indicators are accessible from the SMIS | 4.0759 | .52505 | Capable to a Much |
| (School Management IS) | | | Extent |
| Support staff related to the proper functioning of technology- | 4.1650 | .62848 | Capable to a Much |
| related apps is available 24/7 | | | Extent |
| Performance evaluation of teaching and non-teaching staff are | 4.4191 | .64018 | Capable to a Very |
| conducted online for easy reference and analysis | | | Much Extent |
| General Weighted Mean | 4.1377 | (Capa | ble to a Much Extent) |

The analysis of data, as seen in the table below, revealed that the indicator "the institution is a technology capable as performance evaluation of teaching and non-teaching staff are conducted online for easy reference and analysis" was rated highest by the respondents with a weighted mean of 4.4191 (SD = .64018) which is interpreted as "capable to a very much extent". The least rated indicator is "Scheduling of commonly required student transactions (e.g. class scheduling, treasury services, registrar's services, and other student-related services) are institutionalized" with a weighted mean of 3.9505 (SD = .75084) which is interpreted as "capable to a much extentOverall, the subjected higher education institution is perceived by respondents to be technologically capable with respect to innovative technology environment to a "much extent" with a general weighted mean of 4.1377.



Karimov (2021) articulated in his scholarly work that under its prism, the system checks the students in the knowledge of specialized disciplines. Modern methods of measuring the level of training of students focused on the use of computer technology, and fully meet the realities of the present, provide fundamentally new opportunities, increase the effectiveness of the teacher – and most importantly provide new learning opportunities for students. The article found that students of the object of study are transformed into a subject of study, consciously involved in the learning process, and make their own decisions associated with it.

In summary, the three hundred-three individuals who consented to participate in this study have perceived that the subjected higher education institution is "capable to a much extent" as far as its technological capabilities are concerned. Furthermore, human resources as a dimension of technological capability is rated highest with a general weighted mean of 4.1857, while the least rated dimension is information technology infrastructure with a general weighted mean of 3.9031.

2. Organizational Competitiveness

2.1. In Terms of Institutional Performance

The extent of organizational competitiveness of the subjected higher educational institution is measured in terms of economic performance and institutional performance. The results are as follows.

Table 6

Organizational Competitiveness in terms of Institutional Performance

| Indicators | Weighted | Standard | Verbal Description |
|--|----------|-----------|--------------------|
| The institution is competitive with respect to institutional | Mean | Deviation | |
| performance, in as much as | | | |
| Our graduates are generally employed right after graduation | 4.4455 | .62203 | Competitive to a |
| | | | Very Much Extent |
| There is a low or minimal student drop-outs | 4.4128 | .74335 | Competitive to a |
| | | | Very Much Extent |
| Many of our students are recipients of awards, and win | 4.3924 | .96096 | Competitive to a |
| competitions held outside of the school | | | Very Much Extent |
| Our Board Programs surpasses national passing rate (in the board | 4.3927 | .91032 | Competitive to a |
| exam) | | | Very Much Extent |
| Our Faculty Members are invited as Guest Speakers / Facilitators / | 4.3564 | .65988 | Competitive to a |
| Trainers in training workshops / seminars / conferences – both in | | | Very Much Extent |
| the regional and national levels | | | • |
| Many of our programs are Level 3 (or above) accredited by | 3.9505 | .68633 | Competitive to a |
| recognized accreditation agencies | | | Very Much Extent |
| Other HEIs compliments and bench-mark with us | 3.8944 | .72473 | Competitive to a |
| - | | | Very Much Extent |
| General Weighted Mean | 4.2635 | (Competit | ive to a Very Much |
| - | | Extent) |) |

The analyses revealed that the indicator "this institution is competitive with respect to institutional performance as the graduates are generally employed right after graduation" is rated highest with a weighted mean of 4.4455 (SD = .62203) which is interpreted as "competitive to a very much extent". This is followed by the indicator "there is low or minimal student drop-outs" with a weighted mean of 4.4128 (SD = .74335). The least rated indicator is "other HEIs compliments and bench-mark with us" with a weighted mean of 3.8944 (SD = .72473).



Overall, the respondents perceived the subjected higher education institution is competitive to a very much extent for institutional performance; with a general weighted mean of 4.2635.

2.2. In terms of Economic Performance

 Table 7

 Organizational Competitiveness in terms of Economic Performance

| Indicators | Weighted | Standard | Verbal Description |
|---|----------|-----------|--------------------------------------|
| The institution is competitive with respect to economic | Mean | Deviation | |
| performance, in as much as | | | |
| Salaries are better compared to region-wide salary standards | 3.8449 | .69866 | Competitive to a |
| Student population is on an upward trend | 4.0231 | .54237 | Much Extent Competitive to a |
| Monetary benefits are institutionalized | 3.7624 | .55460 | Much Extent Competitive to a |
| · | 3.7024 | .55400 | Much Extent |
| Student loyalty is observed; from basic education to graduate education | 4.2211 | .55704 | Competitive to a Much Extent |
| Our market-share is rated as "very good" | 4.2310 | .71832 | Competitive to a Very Much Extent |
| Financial liquidity is rated as "very good" | 4.4304 | .62335 | Competitive to a |
| Net profit after taxes is observed to be increasing year-on-year | 3.9076 | .66159 | Very Much Extent Competitive to a |
| | | | Very Much Extent |
| General Weighted Mean | 4.0601 | | (Competitive to a Much |
| | Extent) | | |

The analyses revealed that the indicator "this institution is competitive with respect to economic performance as its financial liquidity is considered as very good" is rated highest with a weighted mean of 4.4304 (SD = .62335) which is interpreted as "competitive to a very much extent". The least rated indicator is "salaries are better compared to region-wide salary standards" with a weighted mean of 3.8449 (SD = .69866). Overall, the respondents perceived the subjected higher education institution is competitive to a much extent with respect to economic performance; with a general weighted mean of 4.0601.

The private education industry is very competitive, and hence higher education institutions must exert efforts to stay sustained – in which digital transformation can significantly play a role (Grigovescu, 2021). Economic performance as a measure of organizational competitiveness is posited to be an antecedent of intensive digitization initiatives in an academic landscape (Isaac et al, 2019). Digital governance improves the efficiency of systems in general (Tiwari, 2022) resulting in improved organizational performance – in which digital governance's main thrust is to make employees' lives easier in the performance of tasks and responsibilities and thereby improve stakeholder satisfaction.

3. Influence of Technological Capability on Organizational Competitiveness

The influence of the components of technological capabilities on the components of organizational competitiveness is measured, the results of which are as follows.

The multiple regression analysis, particularly applying partial least-square structural equation modeling (PLS-SEM), revealed that technological capability concerning information technology infrastructure (β -coefficient = .216; p-value = .045), technology adoption (β -coefficient = .203; p-value =



.003), human capital (β-coefficient = .390; p-value = .041), investment innovation in technology (β-coefficient = .338; p-value = .000), and innovative technology environment (β-coefficient = .235; p-value = .005) have all been found to have significant impacts on institutional performance as a sub-dimension of organization competitiveness – as all the computed p-values are less than the 0.05 level of significance (Makowsky et al, 2019).

Table 8

| Technological Competitiveness Standardized β-coefficient Coefficient Coeffici | Influence of Technological Capability on Organizational Competitiveness | | | | | | |
|--|---|-----------------|-----------------|---------|-----------------|--|--|
| Information Technology Infrastructure Economic Performance Institutional Performance Investment Innovation in Technology Institutional Performance Innovative Innovative Innovative Institutional Institutional Performance Innovative Institutional Performance Innovative technology environment significantly influences institutional performance Innovative technology environment significantly influences institutional performance Innovative technology environment significantly influences economic institutional performance Innovative technology environment significantly influences institutional performance Institutional Performance Innovative technology environment significantly influences economic economic institutional performance Institutional Performance Institutional Performance Institutio | Technological | Organizational | Standardized β- | p-value | Decision | Conclusion | |
| Technology Infrastructure Economic Seconomic S | Capability | Competitiveness | coefficient | | $(\alpha=0.05)$ | | |
| Technology Performance Seconomic S | Information | Institutional | .216 | .045 | Reject Ho | Information technology significantly | |
| Economic Performance Saze | 0. | Performance | | | | influences institutional performance | |
| Technology Institutional Institutional Performance Institutional Institutional Performance Institutional Institutional Institutional Performance Institutional Institutional Performance Institutional P | Infrastructure | Economic | .326 | .017 | Reject Ho | Information technology significantly | |
| Adoption Performance Economic Performance Human Capital Institutional Performance Economic Performance Human Capital Performance Economic Institutional Performance Economic Performance Economic Performance Economic Performance Investment Institutional Institutional Performance Institutional Performance Institutional Performance Institutional Performance Institutional Institutional Institutional Performance Institutional Performance Institutional Performance Institutional Institutional Performance Economic Performance Institutional Performance Institutional Performance Economic Institutional Performance Economic Performance Economic Performance Institutional Perform | | Performance | | | , | | |
| Economic Performance Sase | Technology | Institutional | .203 | .003 | Reject Ho | | |
| Performance Institutional Performance Institutional Performance Institutional Performance Institutional Performance Performance Institutional Performance Institutional Performance Institutional Institutional Performance Institutional Institutional Performance Institutional Institutional Institutional Performance Institutional Institutional Institutional Institutional Institutional Institutional Institutional Performance Institutional Performance Institutional Performance Performance Performance Institutional Performance Performance Performance Institutional Performance Performance Performance Institutional Performance Pe | Adoption | Performance | | | | institutional performance | |
| Human Capital Institutional Performance Institutional Performance Investment Innovation in Technology Economic Performance Institutional Performanc | | Economic | .382 | .000 | Reject Ho | Technology adoption significantly influences | |
| Performance Economic041 .514 Accept Ho Human capital does not significantly influences economic performance Investment Institutional Performance Economic Performance Institutional .338 .000 Reject Ho Investment innovation in technology significantly influences economic performance Economic Performance .120 .127 Accept Ho Investment innovation in technology does not significantly performance Economic Performance .120 .127 Accept Ho Investment innovation in technology does not significantly influences economic performance Innovative Institutional .235 .005 Reject Ho Innovative technology environment significantly influences institutional performance Economic .203 .002 Reject Ho Innovative technology environment significantly influences institutional performance Economic .203 .002 Reject Ho Innovative technology environment significantly influences economic | | | | | | ± | |
| Economic Performance Ferformance Linvestment Investment Innovation in Technology Performance Linvestment Investment Innovation in Technology Performance Linvestment | Human Capital | | .390 | .041 | Reject Ho | | |
| Economic Performance Investment Institutional Performance Economic Performance Institutional Performance Economic Performance Innovation in Technology Innovative Institutional Performance Innovative Technology Economic Performance Innovative Technology Economic Performance Institutional Performance Innovative Institutional Performance Economic Performance Innovative Institutional Performance Economic Performance Innovative Technology Performance Economic Performance Economic Performance Innovative Institutional Performance Economic Performance Economic Performance Economic Performance Economic Performance Economic Performance Innovative technology environment significantly influences institutional performance Economic Performance Economic Performance Economic Performance Innovative technology environment significantly influences economic | | Performance | | | | | |
| Performance Institutional Institutional Investment Investmen | | | | | | | |
| Investment Institutional Performance Economic Performance Innovative Investment Environment Economic Performance Institutional Performance Innovative Environment Economic Performance Innovative Economic Performance Innovative Environment Economic Performance Innovative Economic Performance Innovative Environment Economic Performance Innovative Economic Performance Innovative Economic Performance Economic Performance Innovative Economic Innovative Innovative Innovative Influences Institutional Innovative Influences Influe | | | 041 | .514 | Accept Ho | | |
| Innovation in Technology Economic Performance Economic Performance Innovative Institutional Performance Innovative Performance Environment Economic Performance Institutional Performance Innovative Performance Economic Performance Economic Performance Economic Performance Innovative Performance Economic Performance | Ŧ | | 220 | 000 | D : . II | | |
| Technology Economic | | | .338 | .000 | Reject Ho | 23 | |
| Economic Performance Innovative Institutional Performance Performance Economic Performance Innovative Institutional Performance Performance Performance Economic Performance Performance Innovative Performance Performance Innovative Innovative Innovative Innovative Influences Institutional Innovative Influences Institutional Innovative Influences Institutional Innovative Innovative Influences Institutional Innovative Innovati | | Performance | | | | | |
| Performance significantly influences economic performance Innovative Institutional Performance Performance Environment Economic 203 .002 Reject Ho Innovative technology environment performance Economic .203 .002 Reject Ho Innovative technology environment significantly influences institutional performance Economic significantly influences economic | recimology | | | | | • | |
| Innovative Institutional Performance Performance Economic Performance | | | .120 | .127 | Accept Ho | | |
| Innovative Technology Performance Economic Performance Economic Performance Economic Performance Economic Performance Economic Performance Economic Performance Economic Performance Economic Performance Economic Performance Economic Significantly influences economic economic | | Performance | | | | | |
| Technology Environment Performance Economic Performance 203 | Innovative | Institutional | 235 | 005 | Reject Ho | • | |
| Environment Economic .203 .002 Reject Ho Innovative technology environment significantly influences economic | | | .233 | .005 | reject 110 | | |
| Performance significantly influences economic | Environment | | | | | performance | |
| Performance significantly influences economic | | Economic | 203 | 002 | Reject Ho | Innovative technology environment | |
| 6 · · · · · · | | | .203 | .002 | Reject 110 | 23 | |
| | | | | | | 2 3 | |

Furthermore, the same PLS-SEM revealed that technological capability to information technology infrastructure (β -coefficient = .3216; p-value = .017), technology adoption (β -coefficient = .382; p-value = .000), and innovative technology environment (β -coefficient = .203; p-value = .002) have been found to have significant impacts on economic performance as a sub-dimension of organization competitiveness – as all the computed p-values are less than the 0.05 level of significance (Makowsky et al, 2019).

On the other hand, the same PLS-SEM implicated that technological capability concerning human capital (β -coefficient = -.041; p-value = .514) and investment innovation in technology (β -coefficient = .120; p-value = .127) have both been found to have no significant impacts on economic performance as a sub-dimension of organizational competitiveness – as their computed p-values are greater than the 0.05 level of significance (Makowsky et al, 2019).

From the results of the multiple regression analyses, the final framework was conceptualized (see figure below).



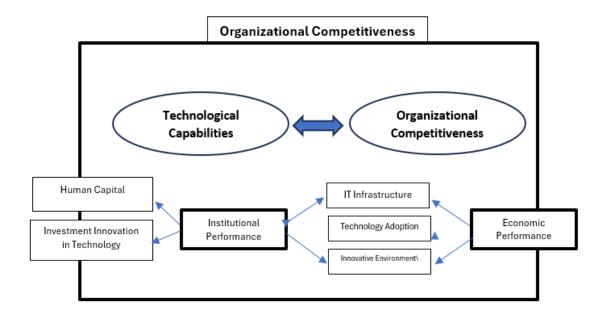


Figure 2. Organizational Competitiveness

Technological capabilities of a higher education institution for human capital, investment innovation in technology, innovation technology environment, IT infrastructure, and technology adoption are imperatives towards the assurance of enhanced organizational competitiveness concerning institutional performance. On the other hand, the technological capabilities of a higher education institution for information technology infrastructure, technology adoption, and innovation environment are imperative for the assurance of enhanced organizational competitiveness concerning economic performance.

Conclusions

The study implicated technological capabilities significantly impact organizational competitiveness. Additionally, IT infrastructure, technology adoption, human capital, innovation technology, and innovation environment are significantly correlated with institutional performance; while IT infrastructure, technology adoption, and innovation environment are significantly correlated with economic performance.

Recommendations

With careful consideration of the findings, together with the major thrust of the study, the following recommendations were drawn.



- 1. Top executives of the subject higher education institution are recommended to continue giving support on all initiatives and efforts towards enhancing the technological capabilities of the institution.
- 2. University personnel should be allowed to upscale their technological skills through participating in training workshops both organized by the institution itself and outside providers.
- 3. The institution is encouraged to increase employee morale and interest in embracing technology as a matter of process and procedural efficiency via the holding of re-orientation and awareness campaigns.
- 4. Policymakers of institutions should re-examine and align all existing policies and procedures contained in the institutional manual of operations towards digitization.

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