Knowledge management capabilities - an empirical investigation

A. S. Ogunbanwo1, J. O Okesola2, Buckley Sheryl1
1School of Computing, University of South Africa, South Africa
2Computational Sciences Department, First Technical University, Ibadan, Nigeria

Corresponding email: 58556214@mylife.unisa.ac.za

Abstract - Many authors have worked on the impacts of KM in business sector but very few on its influence on academic performance (AP). The studies on KM concept and its applications suggested that both process capability and strategy capability could drive innovation and improve institutional performance. However, these studies were not empirically validated thereby subjecting their findings to dispute. Grouping KM Capabilities into three, and adopting Survey method where questionnaires were administered to extract data from 10 Nigerian universities, this study empirically examines the relationship amongst the KM capabilities components and their influence on AP. SPSS was used to the data. Frequency and percentage count were used to analyse the demographic data while factor analysis, Pearson correlation and multiple linear regression were used for the hypotheses. The results showed that there is a significant relationship amongst the KM capabilities components and that a positive linear relationship exists between the KM capabilities and the key AP indicators thereby suggesting that KM capabilities has a positive influence on AP. Nigerian institutions are to be giving more attention to Enabler Capabilities which proved to be the most influencing factor amongst the indicators.

Keywords: Academic performance; enabler capability; knowledge management; process capability; strategy capability; tertiary institutions

1. Introduction

Knowledge is power [1] and its importance cannot be overemphasized. According to Howell & Annansingh [2], the survival of an organisation depends on how it disseminates and share its knowledge as knowledge plays a bigger role in creating value creation. Hence, there is a need for proper knowledge implementation into daily organizational activities. Similarly, the vision of education designed to provide experts can be driven by KM implementation [3] which should be embraced by tertiary institutions for preventing both the intellectual capital and scientific product from dropping on a massive scale [4].

According to Chu [5], KM is a formulation process that establish an environment where staff create, share, learn and reuse knowledge to achieve organization goals. In the education setting, KM is regarded as a tool which inspires tertiary institutions on how to meet up with challenge of the knowledge era [6]. Universities investment in KM is basically to build a knowledge capability that facilitates the effective management and flow of information and knowledge within the university community [7]. This is because KM Capabilities are vital to organizations that desire to advance in innovation [8]. This is the motivation for this study to empirically examine the influence of knowledge management capabilities on AP in the tertiary institutions.
2. Literature Review

Different researchers have come up with different frameworks to support KM practice success.

2.1 KM Capabilities

There are several activities involved in managing knowledge but some are regarded as elements that facilitate knowledge or knowledge resources. They are those categorized under one umbrella called Knowledge Management Capabilities (KMC). To remain within the scope of this study, KMC is grouped into three categories - Knowledge Management Process Capabilities (KMPC), Knowledge Management Enabler Capabilities (KMEC) and Knowledge Management Strategy Capability (KMSC).

2.1.1 KM process capabilities (KMPC)

KMPC is responsible for converting personal knowledge to institutional knowledge [9]. It has many components such that different researchers attribute different elements to it. For instance, Tongsamsi & Tongsamsi [10] recognized knowledge acquisition process, conversion process, dissemination process and application process as components of KMPC whereas, Sangari et al. [9] acknowledge knowledge creation, knowledge capture, knowledge organization, knowledge storage, knowledge dissemination, and knowledge application [9]. Similarly, Chang & Lin [11] identify knowledge creation, storage, transfer and application as component of KMPC but Lee and Wong [12] recognize knowledge acquisition, creation and generation, application and utilization, codification and storing and transferring and sharing. Lyu, Zhou, & Zhang [13] declared knowledge acquisition, creation, application, storage, transfer, and sharing. Likewise, Tan & Wong [14] acknowledged knowledge acquisition, Knowledge creation and generation, Knowledge utilization and application, knowledge storing and updating, Knowledge sharing and transferring and Knowledge protection as component of KMPC.

Going by various submissions with clear emphasis on the general activities common to these researchers, this author proposes Knowledge Capture (KC), Knowledge Storage (KST), Knowledge Sharing (KS) and Knowledge Reuse (KR) as the main KMPC for tertiary institutions.

2.1.2 KM enabler capabilities (KMEC)

KMEC are factors put in place to make way for the success of KM. According to Dhamdhere Namdev [15] enabler is a solution for transmitting knowledge to the right people at the right time for achieving the aim and objectives of the institution. Bixler [16] emphasized the need to address KMEC in an organisation. A lot of research has been done and still ongoing on what components of KMEC should be. Different factors have also been presented as components of KMEC. Chu [5] declared people, processes and technologies while Naser, Al Shobaki, & Amuna [17] suggested processes, leadership, people, outcomes, knowledge and Process as the components. Similarly, Sharma & Kaur [18] recognised Organizational Culture, Organizational Structure, Human Resource and Technological Support but Atallah, Athab, & Abed [19] recognized strategy, culture, ICT infrastructure, systematic processes and rewards. Bharadwaj, Chauhan, & Raman [20] also presented infrastructure, structure, and culture as components of KMEC when Majin, Eslampanah, & Jamshidinavid [21] proposed organizational structure, employee and Information technology.
Going by literatures reviewed, there are varying components of KMEC although, the following are commonly recognized by the majority: leadership, people, organizational process and technology infrastructure. Hence, this study considered these common factors as the components for the enabler capabilities.

2.1.3 KM strategy capability (KMSC)

KMSC is a policy for better KM and becomes a benchmark for organizations that desire successful KM implementation[22], [23]. Oluikpe [22] adopted secondary data and case study to investigate how KMSC was implanted in the business process of the Central Bank of Nigeria. He reported that KM strategy was aligned with the bank’s business strategy as there was an increase in knowledge flow among the employees. Despite the emphasis on KM, organizations still lack appropriate KM strategy[23].

2.2 Academic Performance

Tertiary institutions are made up of components which comprises of academic, research and training of non-academic, student, and faculty members. All these components are involved in the KM process [24] to create and consume knowledge. Institutional Knowledge is of two types - academic and organisation knowledge [25]. Academic knowledge is the primary purpose of the institution while organization knowledge is the overall business knowledge of the institution.

AP is the quality services provided by an institution and serves as a measure of KM in tertiary institutions[26]. The measuring indicators of AP may be tailored to the accomplishment of the goals and objectives of an institution [6]. Tertiary institutions are meant to produce employable graduate. Hence, Russli & Kassim[26] and Ayodele, Odadokun, & Gbadegesin[27] related effective performance of employed graduate to their AP. Russli & Kassim[26] further identified research as crucial factor to tertiary institution’s existence and innovation as power behind creation of new ideas which make increased research output (IRO) and innovativeness amongst the KM Key performance indicator (KPI). Meanwhile, Sharma & Kaur[28] has declared that application of KM could result in performance increase that boost the quality and efficiency of any institution. This study therefore considered all these keywords to propose the following KPI for AP; grounded graduate (GG), increased research output (IRO), performance increase (PI) and innovativeness.

2.3 KM Enhance AP

According to Ramakrishnan & Yasin [29] putting in place a system that support knowledge management in tertiary institution will enhance the institution performance and productivity. Also, Fattahiyan et al., [7] submitted that KM can increase knowledge flow, build knowledge capacity and improve institutional capabilities in decision making thereby reducing “product” development cycle time but improve academic and administrative services [30].

Russli & Kassim[26] studied the relationship between the AP and the KM capabilities process. Although their framework has not been tested empirically, they suspected that there is a relationship between AP and process capabilities. Ali Zwain et al.[6] conducted the same investigation but discovered that all the process capabilities have impacts on AP. However,
Fattahiyan et al.[7] examined the relationship between the two variables and discovered that not all knowledge capability has effect on university’s performance.

3. Research Model and Hypotheses

The main purpose of the research is to investigate empirically the influence of knowledge management capabilities on AP in the Nigeria tertiary institutions. The following research question was raised to address this objective: “Can knowledge management capabilities influence AP”? Also, following research hypotheses were formulated to answer the research question.

3.1. (To determine relationship among the variables)

H1: There is significant relationship among the KMPC (knowledge creation, storing, sharing and reuse).

H2: There is significant relationship among the KMEC (leadership, people, technology infrastructure and organisation structure).

H3: There is significant relationship among the KMC (Process, Enabler & Strategy).

3.2. To determine relationship between KMC (Process -PC, Enabler -EC & Strategy -SC) and Academic Performance - AP (Grounded Graduate -GG Increased Research Output -IRO, Performance Increased -PI and Innovativeness -INN).

H4: There is a positive linear relationship between KM capabilities and GG

H5: There is a positive linear relationship between KM capabilities and IRO,

H6: There is a positive linear relationship between KM capabilities and PI

H7: There is a positive linear relationship between KM capabilities and Innovativeness (INN)

Fig. 1 represents the conceptual framework for the study. It depicts enabler capabilities (people, technology, leadership & organisation), KM strategy capabilities, KM Process capabilities as variables that contribute to the KM success – a factor that enhances academic performance.

4. Methodology

The study adopted survey research design over a targeted population of 500 using purposive sampling to select 50 respondents from each of the 10 universities. From the 500 questionnaire sent out 456 were returned which indicated that 465 participated in the research which were used for analysis.

4.1 Instrumentation

456 out of 500 questionnaire administered were returned. Closed ended questionnaire were used for the data collection and Likert scaling was adopted as the instrument measuring scale. The questions were respectively apportioned with score ranging from 1 to 4 for ‘strongly disagree’,
‘disagree’, ‘agree’ and ‘strongly agree’. The reliability and validity of the instrument were tested using (Cronbach’s alpha reliability and Bartlett's test of sphericity) as the statistical instrument.

Fig.1: KM Enhances AP (own compilation)

4.2 Data analysis:
Descriptive statistics of frequency count, percentage score, bar chart and pie chart were adopted to analyse the demographic data while factor analysis, Pearson correlations, and multiple regression analysis were employed to test the hypotheses. The following rules were considered in accepting or rejecting the hypothesis.

Rule 1 If the p value is greater than 0.05 (p<0.05), accept the null hypothesis
Rule 2 If the p value is less than 0.05 (p>0.05), accept the alternate hypothesis
Rule 3 0.00<R<0.33 indicates weak relationship
Rule 4 0.34<R<0.66 indicates moderate relationship
Rule 5 0.67<R<1.0 indicates strong relationship
Rule 6 + sign indicates positive relationship
Rule 7 - sign indicates negative relationship
5. Results

The research findings are presented and discussed as follows:

5.1 Testing of Research Instrument

Table 1 suggests that the instrument measuring dependent variables is reliable, consistent and acceptable because the Cronbach’s alpha reliability test coefficient for each variable is greater than 0.9. Table 2 shows that factor loadings for all constructs is greater than 0.4, percentage variance is greater than 60% and the KMO greater than 0.5. Similarly, Bartlett’s test of sphericity and Cronbach’s alpha put the reliability of the instrument at alpha = 0.001 and alpha greater 0.7. All these statistics confirm that the instrument measuring independent variables is valid.

Table 1: Reliability Result for Dependent Variables

|                | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|----------------|----------------------------|-------------------------------|----------------------------------|---------------------------------|
| AP Grounded Graduate | 11.76                      | 1.018                         | .993                             | .991                            |
| AP Increase research output | 11.76                      | 1.023                         | .992                             | .991                            |
| AP Innovativeness     | 11.76                      | .989                          | .987                             | .993                            |
| AP Performance increase | 11.75                      | 1.071                         | .977                             | .996                            |

Table 2. Validity and Reliability Result for Independent Variables

|                | Constructs                  | Factor Loading | Cronbach's Alpha | % of Variance | KMO  | Bartlett's test of Sphericity |
|----------------|-----------------------------|----------------|------------------|---------------|------|-------------------------------|
| Independent Variables       | Knowledge Capture           | .449 .976 .974 | .763             | 70.093        | 0.531 | 0.001                         |
|                            | Knowledge Sharing           | .756 .944 .951 | .865             | 78.943        | 0.631 | 0.001                         |
|                            | knowledge Reuse             | .414 .972 .963 | .747             | 63.117        | 0.517 | 0.001                         |
|                            | Knowledge Storing           | .841 .970 .965 | .919             | 86.021        | 0.661 | 0.001                         |
|                            | Process Capabilities        | .790 .489 .853 .483 | .818            | 65.381        | 0.613 | 0.001                         |
|                            | Leadership                  | .927 .926 .928 .920 | .943            | 85.585        | 0.872 | 0.001                         |
|                            | People                      | .932 .930 .755 .926 | .908            | 79.047        | 0.770 | 0.001                         |
|                            | Technology Infrastructure    | .888 .895 .833 .605 | .822            | 66.214        | 0.696 | 0.001                         |
|                            | Organisation Structure      | .812 .833 .874 .928 | .885            | 74.462        | 0.730 | 0.001                         |
|                            | Enabler capabilities        | .973 .985 .982 .984 | .994            | 98.009        | 0.813 | 0.001                         |
|                            | Strategy                    | .461 .910 .844 .869 .798 | .829            | 62.863        | 0.724 | 0.001                         |

5.2 Demographic Characteristics of the Respondents

Table 3 described the demographic characteristics of the participants. For the gender male has the highest percentage than the female. The academic qualification result shows that undergraduate has the highest percentage of participants while the Bachelor degree holders have the lowest. For number of participants from each institution. The result shows that Federal University of Agriculture, University of Ibadan, Tai Solarin University and OlabisiOnabanjo University have the highest respondents at 50 participants each. While Babcock University and Crawford University have the lowest number at 36 each. Other universities fell in between 36
and 50. Also, the public universities have the highest respondents representing 54.8% of the population.

Table 3. Demographic characteristics of the respondents.

| Gender       | Frequency | Percentage |
|--------------|-----------|------------|
| Male         | 250       | 54.8       |
| Female       | 206       | 45.2       |

| Academic Qualification   | Frequency | Percentage |
|---------------------------|-----------|------------|
| Undergraduate             | 288       | 63.2       |
| Bachelor's Degree         | 40        | 8.8        |
| Master's Degree           | 87        | 19.1       |
| PhD                       | 41        | 9          |
| Babcock University        | 36        | 7.9        |
| Bell University           | 45        | 9.9        |
| Crawford University       | 36        | 7.9        |
| Augustine University      | 46        | 10.1       |

| Institutions              | Frequency | Percentage |
|----------------------------|-----------|------------|
| University of Agriculture Abeokuta | 50       | 11         |
| University of Ibadan       | 50        | 11         |
| Covenant University        | 44        | 9.6        |
| Tai Solarin University of Education | 50 | 11 |
| Lagos State University     | 49        | 10.7       |
| OlabisiOnabanjo University | 50        | 11         |
| Lagos State University     | 49        | 10.7       |
| OlabisiOnabanjo University | 50        | 11         |

| Category of the Institution | Frequency | Percentage |
|-----------------------------|-----------|------------|
| Public                      | 250       | 54.8       |
| Private                     | 206       | 45.2       |

5.3 Test of Hypotheses and Discussion

5.3.1 Hypothesis 1

H1: There is significant relationship among the KMPC

Table 4 shows the Pearson correlation analysis with correlation coefficient (r) range as .38 < |r| < .96 and p < 0.001. Based on rule 1 and 4 stated in section 4.2, the alternate hypothesis is accepted. Hence, there is a moderate relationship amongst the process capabilities.

Table 4: Correlations: Among Process Capabilities

| Knowledge Capture | Knowledge Sharing | Knowledge Reuse | Knowledge Storing |
|-------------------|-------------------|-----------------|------------------|
| Pearson Correlation | 1 .960** .387** .402** |
| Sig. (2-tailed)   | .000              | .000            | .000             |
| Knowledge Sharing | Pearson Correlation | 1 .469** .446** |
| Sig. (2-tailed)   | .000              | .000            | .000             |
| Knowledge Reuse   | Pearson Correlation | .469** 1 .506** |
| Sig. (2-tailed)   | .000              | .000            | .000             |
| Knowledge Storing | Pearson Correlation | .402** .446** 1 |
| Sig. (2-tailed)   | .000              | .000            | .000             |

** Correlation is significant at the 0.01 level (2-tailed).

b. Listwise N=456

5.3.2 Hypothesis 2

H2: There is significant relationship among the knowledge management enabler capabilities
Pearson correlation analysis as presented in table 5 shows the correlation coefficient \( r \) range as \( .96 < |r| < .98 \) and \( p < 0.001 \). Going by rule 1 and 5 stated in section 4.4, the alternate hypothesis is accepted thereby confirming existence of a strong relationship amongst the process capabilities.

| Table 5: Correlations\(^b\): Among Enabler Capabilities |
|---------------------------------------------------------|
| **Leadership** | **People** | **Technical Infrastructure** | **Organisation Structure** |
| Leadership | Pearson Correlation | 1 | .981** | .961** | .966** |
| | Sig. (2-tailed) | .000 | .000 | .000 |
| People | Pearson Correlation | .981** | 1 | .976** | .975** |
| | Sig. (2-tailed) | .000 | .000 | .000 |
| Technical Infrastructure | Pearson Correlation | .961** | .976** | 1 | .989** |
| | Sig. (2-tailed) | .000 | .000 | .000 |
| Organisation | Pearson Correlation | .966** | .975** | .989** | 1 |
| | Sig. (2-tailed) | .000 | .000 | .000 |

**. Correlation is significant at the 0.01 level (2-tailed).

b. Listwise N=456

5.3.3 Hypothesis 3

H\(_3\): There is a significant relationship among the KMC.

Table 6 depicts the Pearson correlation analysis with correlation coefficient \( r \) range as \( .45 < |r| < .82 \) and \( p < 0.001 \). Following rule 1 and 3, the alternate hypothesis is accepted suggesting that there is a moderate relationship among the KM capabilities.

| Table 6: Correlations\(^b\) Among the KM capabilities |
|-----------------------------------------------------|
| **Process Capabilities** | **Enabler Capabilities** | **Strategy Capabilities** |
| Process Capabilities | Pearson Correlation | 1 | .535** | .452** |
| | Sig. (2-tailed) | .000 | .000 | .000 |
| Enabler Capabilities | Pearson Correlation | .535** | 1 | .822** |
| | Sig. (2-tailed) | .000 | .000 | .000 |
| Strategy Capabilities | Pearson Correlation | .452** | .822** | 1 |
| | Sig. (2-tailed) | .000 | .000 | .000 |

**. Correlation is significant at the 0.01 level (2-tailed).

b. Listwise N=456

5.3.4 Hypothesis 4

H\(_4\): There is a positive linear relationship between KM capabilities (PC, EC & SC) and Academic Performance (AP): Grounded Graduate (GG)

Table 7 reveals the range of correlation coefficient \( r \) as range \( .43 < |r| < .91 \) and \( p < 0.001 \) which suggests that there is moderate relationship between KMC and GG going by rule 3. The table also shows that both enabler capabilities and strategy capability have strong relationship with GG while process capabilities has moderate relationship. Likewise, amongst others, knowledge sharing was found most significant. Tables 8a and 8b depict the significant regression equation \( F (3, 441) = 982.809, p < .001 \), with an \( R^2 \) of .870, while table 8c presents the p value for each component which is less than 0.05. Enabler capabilities have the highest impact on AP indicator GG (\( \beta = 0.611 \)) follow by strategy capability (\( \beta = 0.274 \)). Hence, the null hypothesis is rejected
and alternate hypothesis accepted, suggesting a positive linear relationship between KM capabilities and grounded graduate.

- **Correlation Analysis**

Table 7: Correlations\(^b\) between KM capabilities (PC, EC, SC) and AP (GG)

| KM Capability factors                              | Academic Performance: Grounded Graduate (GG) |
|----------------------------------------------------|-----------------------------------------------|
| Enabler Capabilities (EC)                          |                                               |
| Leadership (LE)                                    | .909**                                        |
| People (PE)                                        | .886**                                        |
| Technical Infrastructure (TI)                      | .906**                                        |
| Organisation Structure (OS)                        | .909**                                        |
| Principle Component of Enabler Capability (FAC1_12)| .910**                                        |
| Knowledge Capture (KCP)                            | .536**                                        |
| Knowledge Sharing (KSH)                            | .542**                                        |
| Knowledge Storage (KST)                            | .441**                                        |
| Knowledge Reuse (KRU)                              | .437**                                        |
| Process Capabilities (PC)                          |                                               |
| Principle Component of Process Capability (FAC1_6) |                                               |
| Strategy Capability (SC) (FAC1_5)                  | .840**                                        |

\(^**\). Correlation is significant at the 0.01 level (2-tailed).
\(^b\). Listwise N=445

- **Regression Analysis**

Table 8a: Model Summary (AP grounded graduate)

| Model | R       | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|---------|----------|-------------------|---------------------------|
| 1     | .928\(^a\) | 0.862    | 0.861             | 0.128                     |

\(^a\). Predictors: (Constant), Strategy Capabilities (FAC1_5), Process Capabilities (FAC1_6), Enabler Capabilities (FAC1_12)

Table 8b: ANOVA\(^a\)(AP grounded graduate)

| Model     | Sum of Squares | df | Mean Square | F       | Sig.  |
|-----------|----------------|----|-------------|---------|-------|
| Regression| 44.737         | 3  | 14.912      | 915.061 | .000\(^b\) |
| 1         | 7.187          | 441| 0.016       |         |       |
| Total     | 51.924         | 444|             |         |       |

\(^a\). Dependent Variable: AP grounded graduate
\(^b\). Predictors: (Constant), Strategy Capabilities (FAC1_5), Process Capabilities (FAC1_6), Enabler Capabilities (FAC1_12)
Table 8c: Coefficients\(^{a}\)(AP grounded graduate)

| Model                  | Unstandardized Coefficients | Standardized Coefficients | T       | Sig. |
|------------------------|-----------------------------|---------------------------|---------|------|
|                        | B   | Std. Error | Beta |       |      |
| (Constant)             | 3.918 | 0.006   | 647.225 | .000 |
| Process Capabilities   | 0.044 | 0.007   | 0.13 | 6.146 | .000 |
| Enabler Capabilities   | 0.214 | 0.011   | 0.633 | 19.249 | .000 |
| Strategy Capabilities  | 0.085 | 0.011   | 0.25 | 8.045 | .000 |

\(^{a}\) Dependent Variable: AP grounded graduate

5.3.5 Hypothesis 5

H\(_{5}\): There is a positive linear relationship between KM capabilities (PC, EC& SC) and Academic Performance (AP): Increase Research Output (IRO)

The table 9 reveals the range of correlation coefficient (\(r\)) as range .43 < |\(r\)| < .91 and \(p < 0.001\) - an indication of a moderate relationship between KMC and IRO based on the rule 3. The table also uncovers that both enabler capabilities and strategy capability have strong relationship with IRO while process capabilities has moderate relationship. Knowledge sharing has the highest significant value. Tables 10a and 10b equally reveal the significant regression equation obtained; \((F (3, 441) = 915.061, p < .001)\), with an \(R^2\) of .862 while table 10c shows that all the \(p\) value for each component is less than 0.05. Similarly, enabler capabilities have the highest effect on AP indicator IRO (\(\beta = 0.633\)) follow by strategy capability (\(\beta =0.250\)). Hence, null hypothesis is rejected and alternate hypothesis accepted implying that there is a positive linear relationship between KM capabilities and increase research output.

• Correlation Analysis

Table 9: Correlations\(^{b}\) between KM capabilities (PC, EC, SC) and AP (IRO)

| KM Capability factors                          | Academic Performance: Increase Research Output (IRO) |
|------------------------------------------------|------------------------------------------------------|
| Enabler Capabilities (EC)                      |                                                      |
| Leadership (LE)                                | .904**                                               |
| People (PE)                                    | .896**                                               |
| Technical Infrastructure (TI)                  | .905**                                               |
| Organisation Structure (OS)                    | .905**                                               |
| Principle Component of Enabler Capability(EC) (FAC1_12) | .912**                                               |
| Process Capabilities (PC)                      |                                                      |
| Knowledge Capture (KCP)                        | .530**                                               |
| Knowledge Sharing (KSH)                        | .536**                                               |
| Knowledge Storage (KST)                        | .435**                                               |
| Knowledge Reuse (KRU)                          | .432**                                               |
| Principle Component of Process Capability (PC) (FAC1_6) | .592**                                               |
| Strategy Capability (SC) (FAC1_5)              | .831**                                               |

\(^{b}\) Correlation is significant at the 0.01 level (2-tailed).

\(^{b}\) Listwise N=445
- **Regression Analysis**

Table 10a: Model Summary (AP Increase research output)

| Model | R    | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|------|----------|------------------|---------------------------|
| 1     | .933 | 0.87     | 0.869            | 0.123                     |

a. Predictors: (Constant), Strategy Capabilities (FAC1_6), Process Capabilities (FAC1_12), Enabler Capabilities (FAC1_5)

Table 10b: ANOVA (AP Increase research output)

| Model       | Sum of Squares | df  | Mean Square | F        | Sig. |
|-------------|----------------|-----|-------------|----------|------|
| Regression  | 44.441         | 3   | 14.814      | 982.809  | .000 |
| Residual    | 6.647          | 441 | 0.015       |          |      |
| Total       | 51.088         | 444 |             |          |      |

a. Dependent Variable: AP Increase research output
b. Predictors: (Constant), Strategy Capabilities (FAC1_6), Process Capabilities (FAC1_12), Enabler Capabilities (FAC1_5)

Table 10c: Coefficients (AP Increase research output)

| Model   | Unstandardized Coefficients | Standardized Coefficients | t       | Sig. |
|---------|-----------------------------|---------------------------|---------|------|
|         | B                           | Std. Error                | Beta    |      |
| (Constant) | 3.92                       | 0.006                     | 673.365 | .000 |
| 1       | Process Capabilities       | 0.047                     | 0.139   | 6.772 | .000 |
|         | Enabler Capabilities       | 0.205                     | 0.611   | 19.135 | .000 |
|         | Strategy Capabilities       | 0.092                     | 0.274   | 9.082 | .000 |

a. Dependent Variable: AP Increase research output

5.3.6 **Hypothesis 6**

H₆: There is positive linear relationship between KM capabilities (PC, EC, SC) and Academic Performance (AP): Performance Increase (PI)

Table 11 reveals the range of correlation coefficient (r) as range .43 < |r| < .91 and p <0.001 to indicate a moderate relationship between KMC and PI going by rule 3. The table also disclose that enabler capabilities and strategy capability have strong relationship with PI while process capabilities has moderate relationship and process capabilities knowledge sharing have the highest relationship. Tables 12a and 12b depict significant regression equation (F (3, 441) = 985.233, p < .001), with an R² of .870, while table 12c shows that all the p value for each component is less than 0.05Similarly, enabler capabilities has the highest effect on AP indicator PI (β = 0.611) followed by strategy capability (β =0.274). Therefore, null hypothesis is rejected and alternate hypothesis accepted. Hence, there is a positive linear relationship between KM capabilities and performance increase.
• **Correlation Analysis**

Table 11: Correlations between KM capabilities (PC, EC, SC) and AP: (PI)

| KM Capability factors                  | Academic Performance: Performance Increase (PI) |
|----------------------------------------|-----------------------------------------------|
| Enabler Capabilities (EC)              |                                               |
| Leadership (LE)                        | .906**                                        |
| People (PE)                            | .898**                                        |
| Technical Infrastructure (TI)          | .910**                                        |
| Organisation Structure (OS)            | .610**                                        |
| Principle Component of EC (FAC1_12)   | .917**                                        |
| Process Capabilities (PC)              |                                               |
| Knowledge Capture (KCP)                | .513**                                        |
| Knowledge Sharing (KSH)                | .515**                                        |
| Knowledge Storage (KST)                | .428**                                        |
| Knowledge Reuse (KRU)                  | .422**                                        |
| Principle Component of PC (FAC1_6)     | .574**                                        |
| Strategy Capability (SC) (FAC1_5)      | .838**                                        |

**. Correlation is significant at the 0.01 level (2-tailed).  
b. Listwise N=445

• **Regression Analysis**

Table 12a: Model Summary (AP: Performance Increase)

| Model | R       | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|---------|----------|-------------------|----------------------------|
| 1     | .933a   | 0.87     | 0.869             | 0.116                      |

a. Predictors: (Constant), Strategy Capabilities (FAC1_6), Process Capabilities (FAC1_5), Enabler Capabilities (FAC1_12)

Table 12b: ANOVA (AP: Performance Increase)

| Model  | Sum of Squares | df | Mean Square | F                                       | Sig. |
|--------|----------------|----|-------------|-----------------------------------------|------|
| 1      | Regression     | 3  | 13.169      | 985.233                                | .000b|
|        | Residual       | 441| 0.013       |                                         |      |
| Total  | 45.402         | 444|             |                                         |      |

a. Dependent Variable: AP Performance Increase  
b. Predictors: (Constant), Strategy Capabilities (FAC1_5), Process Capabilities (FAC1_6), Enabler Capabilities (FAC1_12)

Table 12c: Coefficients (AP: Increase performance)

| Model            | Unstandardized Coefficients | Standardized Coefficients | t     | Sig.  |
|------------------|----------------------------|---------------------------|-------|-------|
| (Constant)       | 3.925                      | 0.005                     | 715.904| .000  |
| 1 Process Capabilities | 0.032                      | 0.007                     | 0.1   | 4.862 | .000  |
| Enabler Capabilities | 0.207                      | 0.01                      | 0.653 | 20.500| .000  |
5.3.7 **Hypothesis 7**

H7: There is positive linear relationship between KM capabilities (PC, EC, SC) and Academic Performance (AP): INN

Table 13 presents range of correlation coefficient (r) as range .45< |r| < .91 and p <0.001 which suggests a moderate relationship between KMC and INN. The table also uncovers that enabler capabilities and strategy capability have strong relationship with INN while process capabilities has moderate relationship and process capabilities knowledge sharing has the highest significant relationship. In addition, tables 14a and 14b depict the significant regression equation (F (3, 441) = 995.878, p < .001), with an R$^2$ of .871. While table 14c shows that all the p value for each component is less than 0.05. Similarly, enabler capabilities has the highest impact on AP indicator INN ($\beta = 0.651$) followed by strategy capability ($\beta =0.221$). Therefore, null hypothesis is rejected and alternate hypothesis accepted, confirming that there is positive linear relationship between KM capabilities and innovativeness.

- **Correlation Analysis**

Table 13: Correlations Between KM capabilities (PC, EC, SC) and AP (INN)

| KM Capability factors | Academic Performance: Innovativeness (INN) |
|-----------------------|--------------------------------------------|
| Enabler Capabilities (EC) |                                               |
| Leadership (LE)       | .909**                                     |
| People (PE)           | .906**                                     |
| Technical Infrastructure (TI) | .907**                           |
| Organisation Structure (OS) | .907**                                    |
| Principle Component of Enabler Capability (FAC1_12) | .916**                                        |
| Process Capabilities (PC) |                                               |
| Knowledge Capture (KCP) | .541**                                     |
| Knowledge Sharing (KSH) | .549**                                     |
| Knowledge Storage (KST) | .454**                                     |
| Knowledge Reuse (KRU)  | .452**                                     |
| Principle Component of Process Capability (FAC1_6) | .610**                                    |
| Strategy Capability (SC) (FAC1_5) | .826**                                   |

**. Correlation is significant at the 0.01 level (2-tailed).

b. Listwise N=445

- **Regression Analysis**

Table 14a: Model Summary (AP Innovativeness)

| Model | R  | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|----|----------|-------------------|---------------------------|
| 1     | .933a | 0.871   | 0.871             | 0.129                     |

a. Predictors: (Constant), Strategy Capabilities (FAC1_5), Process Capabilities (FAC1_6), Enabler Capabilities (FAC1_12)
Table 14b: ANOVA of (AP Innovativeness)

| Model        | Sum of Squares | df | Mean Square | F     | Sig. |
|--------------|----------------|----|-------------|-------|------|
| Regression   | 49.455         | 3  | 16.485      | 995.878 | .000 |
| Residual     | 7.3            | 441| 0.017       |       |      |
| Total        | 56.755         | 444|             |       |      |

a. Dependent Variable: AP Innovativeness
b. Predictors: (Constant), Strategy Capabilities (FAC1_5), Process Capabilities (FAC1_6), Enabler Capabilities (FAC1_12)

Table 14c: Coefficients of (AP Innovativeness)

| Model             | Unstandardized Coefficients | Standardized Coefficients | t       | Sig. |
|-------------------|-----------------------------|---------------------------|---------|------|
| (Constant)        | 3.916                       | 0.006                     | 641.797 | .000 |
| Process Capabilities | 0.054                      | 0.007                     | 0.152   | 7.473 | .000 |
| Enabler Capabilities | 0.23                       | 0.011                     | 0.651   | 20.519 | .000 |
| Strategy Capabilities | 0.078                      | 0.011                     | 0.221   | 7.359 | .000 |

a. Dependent Variable: AP Innovativeness

6 Conclusion:

Although notable works have been done on the possible impacts of KM on organisation’s performance in business sectors, only very few are available on AP especially in Nigerian tertiary institutions. This study empirically examines the impact of KM capabilities on AP in Nigerian south west tertiary institutions by grouping the KM capabilities into three and employing AP measurement indicators to grade the quality of knowledge possessed and utilized by the institutions.

The results show that process capabilities has moderate relationship with AP indicators while the enabler capabilities and strategy capability has strong relationship with the AP indicators. Regression analysis similarly has a positive linear relationship between the KM capabilities and the AP indicators. The linear relationship between the KMC and AP indicators show that KMC is a significant driver of AP. The study is in consistent with related studies that enabler capabilities was the most crucial factor with the highest influence on all the AP and that sharing of professional knowledge increases Job performance.

For Nigerian education system to enhance their AP through KM capabilities, knowledge sharing should be encouraged and serious attention should be placed on the adequacy of the enabler capabilities. Future studies may however research further on the degree of which each university is engaged in KM capacities.

References

[1] Kayıkçı K and Ozan Y (2014). Effects of Knowledge Management Competencies of School Principals’ to Quality Studies in School, Int. J. Bus. Soc. Sci., vol. 5, no. 5, pp. 188–198.

[2] Howell K. E. and Annansingh F. (2013). Knowledge generation and sharing in UK universities:
A tale of two cultures? Int. J. Inf. Manage., vol. 33, no. 1, pp. 32–39.

[3] Krubu D. E. and Krub S. G. (2011). Towards Sustainable Development: An Assessment of Knowledge Management Initiatives in Nigerian Universities. J. Sustain. Dev. Africa, vol. 13, no. 3, pp. 165–177.

[4] Lashkary M., Matin E. K., Kashani B. H., and Kasraei K. (2012). Investigating the Knowledge Management Implementation in Distance Education System in Iran. Inf. Knowl. Manag., vol. 2, no. 7, pp. 61–69.

[5] Chu K. W. (2016) Beginning a journey of knowledge management in a secondary school. J. Knowl. Manag., vol. 20, no. 2, pp. 364–385.

[6] Ali Zwain A. A., Teong L. K., and Othman S. N. (2012). Knowledge Management Processes and Academic Performance in Iraqi HEIs: An Empirical Investigation,” Int. J. Acad. Res. Bus. Soc. Sci., vol. 2, no. 6, pp. 273–293, 2012.

[7] Fattahiyan S., Hoveida R., Siadat S. A., and Talebi H. (2013). The relationship between Knowledge Management Enablers, Processes resources and organizational Performance in Universities (Case Study: selected Universities of the Isfahan Province),” Int. J. Educ. Res., vol. 1, no. 11, pp. 1–14.

[8] He W. and Abdous M. (2013). An Online Knowledge-Centered Framework for Faculty Support and Service Innovation. VINE, vol. 43, no. 1, pp. 96–110.

[9] Sangari M. S., Hosnavi R., and Zahedi M. R. (2015). “The impact of knowledge management processes on supply chain performance An empirical study,” Int. J. Logist. Manag., vol. 26, no. 3, pp. 603–626.

[10] Tongsamsi K. and Tongsamsi I. (2017). “Instrument development for assessing knowledge management of quality assurers in Rajabhat universities, Thailand,” Kasetsart J. Soc. Sci., vol. 38, no. 2, pp. 111–116.

[11] Chang C. L. and Lin T.-C. (2015) “The role of organizational culture in the knowledge management process,” J. Knowl. Manag., vol. 19, no. 3, pp. 433–455.

[12] Lee C. S. and Wong K. Y. (2015) “Development and validation of knowledge management performance measurement constructs for small and medium enterprises,” J. Knowl. Manag., vol. 19, no. 4, pp. 711–734, 2015.

[13] Lyu H., Zhou Z., and Zhang Z. (2016) “Measuring Knowledge Management Performance in Organizations: An Integrative Framework of Balanced Scorecard and Fuzzy Evaluation,” Information, vol. 7, no. 29, pp. 1–11, 2016.

[14] Tan L. P. and Wong K. Y. (2015) “Linkage between knowledge management and manufacturing performance: a structural equation modeling approach,” J. Knowl. Manag., vol. 19, no. 4, pp. 814–835, 2015.

[15] Dhamdhere Namdev S. (2015). Importance of Knowledge Management in the Higher Educational Institutes. Turkish Online J. Distance Educ., vol. 16, no. 1, pp. 162–183.

[16] Bixler C. H. (2002). Applying the four pillars of knowledge management. KMWorld, vol. 11, no. 1, pp. 10–11.

[17] Naser S. S. A., Al Shobaki M. J., and Amuna Y. M. A. (2016). Measuring knowledge management maturity at HEI to enhance performance-an empirical study at Al-Azhar University in Palestine. Int. J. Commer. Manag. Res., vol. 2, no. 5, pp. 55–62.

[18] Sharma M. K. and Kaur M. (2016). Knowledge Management Institutions in Higher Education. IRA-International J. Manag. Soc. Sci., vol. 4, no. 3, pp. 548–555.
[19] Attallah M., Athab M., and Abed W. J. (2015). Review of Knowledge Management Success Factors in Higher Educational Organizations. J. Adv. Comput. Sci. Technol. Res., vol. 5, no. 3, pp. 83–92.

[20] Bharadwaj S. S., Chauhan S., and Raman A. (2015). Impact of Knowledge Management Capabilities on Knowledge Management Effectiveness in Indian Organizations. VIKALPA J. Decis. Makers, vol. 40, no. 4, pp. 421–434.

[21] Majin R. G., Eslampanah M., and Jamshidinavid B. (2015). The Role of Knowledge Management Enabler on Performance Kermanshah Province Maskan Bank. vol. 5, no. 6, pp. 171–177.

[22] Oluikpe P. (2012). Developing a corporate knowledge management strategy. J. Knowl. Manag., vol. 16, no. 6, pp. 862–878.

[23] Al-Hakim L. A. Y. and Hassan S. (2013), “Knowledge management strategies, innovation, and An empirical study of the Iraqi MTS. J. Adv. Manag. Res., vol. 10, no. 1, pp. 58–71.

[24] Hoq K. M. G. and Akter R. (2012). Knowledge Management in Universities: Role of Knowledge Workers,” Bangladesh J. Libr. Inf. Sci. Knowl., vol. 2, no. 1, pp. 92–102.

[25] Munir and Rohendi D. (2012). Development Model for Knowledge Management System (KMS) to Improve University’s Performance (Case Studies in Indonesia University of Education ). Int. J. Comput. Sci. Issues, vol. 9, no. 1, pp. 1–6.

[26] Russli N. A. B. and Kassim N. A (2012). The Relationship Between Knowledge Management Practices (KMP) and Academic Performance: A Conception Framework. in AKEPT 2nd Global Annual Young Researchers Conference & Exhibition pp. 1–12.

[27] Ayodele T. O., Oladokun T. T., and Gbadegesi J. T. (2016). Factors influencing academic performance of real estate students in Nigeria. Prop. Manag., vol. 34, no. 5, pp. 396–414.

[28] Sharma M. and Kaur M. (2016). Knowledge Management Institutions in Higher Education. IRA - Int. J. Manag. Soc. Sci., vol. 4, no. 3, pp. 548–555.

[29] Ramakrishnan K. and Yasin N. M. (2012). Knowledge Management System and Higher Education Institutions in 2012 International Conference on Information and Network Technology, vol. 37, pp. 67–71.

[30] Kidwell J. J., Vander Linde K. M., and Johnson S. L. (2000). Applying Corporate Knowledge Management Practices in Higher Education. Educause, pp. 28–33.