



Performance Measurement Indicators for Academic Staff in Nigerian Higher Institutions: A Case Study of ATBU Bauchi

¹Abdulsalam Ya'u Gital, ¹Mustapha Abdulrahman Lawal, ¹Mahmud Ahmed Usman, ²Ismail Zahraddeen Yakubu

¹Department of Computer Science,
Abubakar Tafawa Balewa University Bauchi, Nigeria

²Department of Computing Technology,
SRM Institute of Science and Technology, India

ABSTRACT

This study focuses on the development of a comprehensive Key Performance Indicator (KPI) management system to evaluate academic staff performance in Nigerian higher institutions, using Abubakar Tafawa Balewa University (ATBU), Bauchi, as a case study. The research aims to establish a holistic framework that considers the diverse roles of academic staff, including teaching, supervision, research, publication, consultancy, and service. A structured approach was employed, involving the formulation of operational indicators through stakeholder engagement via focus groups, workshops, and collaborative discussions. The study utilized a Fuzzy Conjoint Model to analyze the preferences and priorities of academic staff regarding the proposed KPIs, ensuring alignment with their core duties and institutional goals. Results reveal significant insights into the prioritization of responsibilities, with teaching and research emerging as primary areas of focus. The findings provide a foundation for a fair and data-driven performance evaluation system tailored to the context of Nigerian higher education, enhancing accountability and guiding strategic decision-making in academic institutions.

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INTRODUCTION

In the dynamic world of higher education, the performance of academic staff plays a crucial role in determining the success of institutions. As universities strive for excellence in teaching, research, and community engagement, there is a pressing need to adopt more comprehensive approaches to performance evaluation [1]. In Nigerian higher institutions, performance assessment has traditionally relied on metrics such as teaching hours and publication counts. However, these methods provide only a partial view of academic staff contributions and fail to capture the broader spectrum of activities in which faculty members are involved.

Academic staff today are expected to contribute in areas that extend beyond teaching and research, including innovation, consultancy, mentorship, and service to the university and society [2]. As a result, traditional evaluation

metrics are becoming inadequate, necessitating the development of a more robust performance management system. A well-structured KPI system offers a comprehensive solution by incorporating both quantitative and qualitative measures, ensuring a balanced evaluation of faculty members' contributions.

This research aims to address the need for a more holistic performance evaluation framework by designing a KPI management system tailored to Nigerian institutions, with Abubakar Tafawa Balewa University (ATBU), Bauchi serving as the focal point. The developed system will align the diverse roles of academic staff with institutional goals, promoting an environment of accountability and transparency while driving academic excellence.

Corresponding author: Abdulsalam Ya'u Gital

✉ musbaida@gmail.com

Department of Computer Science. Abubakar Tafawa Balewa University, Bauchi.

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A. Case Study: Abubakar Tafawa Balewa University (ATBU), Bauchi

Abubakar Tafawa Balewa University (ATBU), located in Bauchi, Nigeria, has established itself as a leading institution for science, engineering, and technology education since its inception in 1980. With its emphasis on fostering innovation, research, and community service, ATBU plays a key role in contributing to national development through its academic and research activities. However, as the university continues to grow and diversify its academic offerings, the need for a systematic, transparent, and comprehensive performance evaluation process for its academic staff has become increasingly important.

Currently, ATBU, like many Nigerian universities, follows a performance evaluation system that is largely shaped by the guidelines set by the National Universities Commission (NUC). This system places significant emphasis on traditional metrics such as research publications, teaching load, and student feedback. While these factors provide valuable insights, they are often inadequate in fully reflecting the contributions made by academic staff, particularly in areas such as community service, interdisciplinary research, and consultancy.

Given the increasing complexity of academic roles, a more nuanced and data-driven approach is required to accurately measure the performance of faculty members. The proposed KPI management system is designed to address this challenge by incorporating multiple dimensions of academic engagement. These dimensions will include not only teaching and research but also innovation, industry collaborations, leadership roles, and impact on society.

The process of developing these KPIs will involve active participation from key stakeholders within ATBU, including academic staff, administrative personnel, and representatives from relevant external bodies. This inclusive approach ensures that the performance indicators developed are contextually appropriate and aligned with both institutional objectives and national educational standards.

B. Importance of the Study

The significance of this study lies in its potential to transform how academic staff performance is evaluated within Nigerian higher education institutions. Traditional approaches to performance measurement, which rely heavily on metrics such as teaching hours, publication counts, and student feedback, are no longer sufficient to capture the full range of academic responsibilities [3]. This study addresses the critical need for a more holistic and contextually relevant system that recognizes and rewards the diverse contributions made by academic staff.

One of the primary benefits of implementing a comprehensive KPI management system is the ability to align individual performance with the strategic objectives of the institution [4]. By evaluating faculty members across multiple dimensions, such as research, teaching, community engagement, and innovation, the proposed system encourages a balanced approach to academic work. This not only improves job satisfaction among staff but also enhances the overall performance and reputation of the institution.

Moreover, a well-defined KPI system enhances transparency and accountability in the performance evaluation process. It ensures that the evaluation criteria are clear, objective, and based on measurable outcomes. Academic staff are more likely to engage in activities that are aligned with institutional goals when they know their efforts will be appropriately recognized and rewarded [5]. This, in turn, fosters a culture of excellence, collaboration, and continuous improvement within the institution.

Furthermore, the findings from this study have broader implications for the Nigerian higher education sector. By developing KPIs that are specifically tailored to the Nigerian context, this research offers a model that can be adopted and adapted by other institutions across the country. As Nigerian universities continue to strive for global competitiveness, the need for effective and efficient performance management systems becomes increasingly evident. The proposed KPI system has the potential to contribute to the ongoing efforts to enhance the quality and global standing of Nigerian

Corresponding author: Abdulsalam Ya'u Gital

✉ musbaida@gmail.com

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universities, while also promoting innovation and excellence in academic work [6].

LITERATURE REVIEW

C. The Concept of Performance Management in Higher Education

Performance management within higher education has increasingly gained attention over the last decade, as academic institutions worldwide strive to enhance efficiency, accountability, and quality in their operations. Performance management refers to the systematic process through which institutions set expectations, monitor progress, and assess the outcomes of academic and administrative activities. Traditionally, higher education institutions relied on conventional performance metrics such as teaching load, publication output, and student evaluations. However, as the academic landscape evolves, so must the methods for evaluating performance [6].

In the context of higher education, performance management serves multiple purposes. It promotes transparency and accountability, ensuring that faculty members are assessed fairly based on measurable outcomes. It also aligns individual goals with institutional objectives, fostering an environment where academic staff can thrive while contributing to the strategic aims of their universities[4]. However, despite its importance, many higher education institutions in developing nations, including Nigeria, lack comprehensive systems to effectively measure and manage the performance of academic staff (Oboh & Amadi, 2022). This gap necessitates the development of customized performance management frameworks that cater to the specific needs of Nigerian institutions.

D. Key Performance Indicators in Academic Settings

Key Performance Indicators (KPIs) have emerged as critical tools in performance management systems across various sectors, including education. KPIs provide quantifiable measures that help institutions track progress and assess the effectiveness of their strategies and objectives. In higher education, KPIs can span

various domains such as teaching quality, research output, community service, and innovation [7].

In recent years, the development and implementation of KPIs for academic staff have garnered considerable scholarly attention. Research has shown that effective KPI systems contribute significantly to the enhancement of institutional performance by fostering a culture of accountability, encouraging continuous improvement, and promoting excellence in teaching and research [8]. For example, a study conducted by [8] in Nigerian universities highlights the importance of aligning KPIs with both institutional and national educational objectives. Their study emphasizes that KPIs should go beyond quantitative measures like publication counts, incorporating qualitative factors such as mentorship, student satisfaction, and contributions to institutional development.

Similarly, international studies have demonstrated the effectiveness of KPIs in driving academic staff performance. A study by [9] conducted across several European universities showed that institutions with well-defined and robust KPIs experienced higher faculty engagement, improved research output, and better student outcomes. The study also found that academic staff members were more likely to participate in interdisciplinary research and innovation activities when such contributions were explicitly recognized and rewarded through the KPI system.

E. Balanced Scorecard Approach in Higher Education

The Balanced Scorecard (BSC) approach, first introduced by Kaplan and Norton (1992), has been widely adopted across various industries as a performance management framework that integrates financial and non-financial measures. In higher education, the BSC has been adapted to assess institutional performance across multiple dimensions, such as teaching and learning, research, community engagement, and institutional sustainability [10]. The balanced nature of this approach ensures that performance is assessed holistically, providing a more comprehensive view of academic contributions.



Recent studies have emphasized the relevance of the Balanced Scorecard in developing KPIs for academic staff in higher education institutions. According to [11], the BSC approach offers a flexible framework that can be customized to meet the specific needs of individual institutions. This adaptability is particularly valuable for universities in developing countries, where there may be a need to address unique challenges related to resource constraints, governance, and institutional capacity. The study further argues that by using the BSC framework, institutions can integrate strategic objectives with daily operational activities, thereby ensuring that faculty performance is aligned with the institution's long-term goals.

Another study by [12] explored the application of the Balanced Scorecard in Nigerian universities. The researchers found that while the BSC framework was highly effective in promoting transparency and accountability, its implementation was hindered by a lack of institutional support, inadequate training, and resistance from faculty members who were unfamiliar with the system. The authors recommend that institutions invest in training and capacity building to ensure the successful adoption of BSC-based KPI systems.

F. Challenges in Implementing Performance Management Systems in Nigerian Universities

Despite the proven benefits of performance management systems, their implementation in Nigerian higher education institutions has been fraught with challenges [13]. One of the most significant issues is the reliance on outdated and narrow evaluation criteria, which often focus primarily on teaching hours and research publications [14]. These traditional metrics fail to capture the broader range of academic activities, such as participation in community development projects, consultancy work, and contributions to policy development. Furthermore, many universities lack the infrastructure and resources needed to support the implementation of comprehensive performance management systems [15].

Another key challenge is the resistance to change among academic staff. Many faculty members are reluctant to adopt new performance management frameworks, particularly when these systems are perceived as overly complex or burdensome. This resistance is often compounded by a lack of clarity regarding the purpose of KPIs and the methods used to assess them. For performance management systems to be effective, academic staff must be actively involved in the design and implementation process, ensuring that the KPIs reflect their contributions and align with institutional objectives.

G. The Role of Innovation and Community Engagement in Academic Performance Evaluation

In contemporary higher education, the role of academic staff extends beyond the traditional domains of teaching and research. Faculty members are increasingly expected to contribute to innovation, entrepreneurship, and community engagement. These activities play a critical role in bridging the gap between academia and industry, fostering partnerships that drive economic growth and societal development [16].

Recent studies have highlighted the importance of incorporating these dimensions into academic performance evaluations. For instance, [17] argue that innovation and community engagement are essential components of academic success, particularly in universities that aim to address societal challenges. Similarly, [18] emphasize the need for performance indicators that capture the impact of academic staff on their communities, whether through consultancy work, public policy contributions, or involvement in social development initiatives.

METHODOLOGY

This study adopts a mixed-method approach, combining qualitative and quantitative research techniques to meet its objectives. According to [19], qualitative research primarily seeks to understand and provide insight into the study area without necessarily drawing definitive conclusions. It focuses on personal interactions, verbal data, and observations collected through



direct contact with participants. On the other hand, the quantitative method is used to collect measurable data, allowing for statistical analysis and empirical findings.

[20] advocate for a sequential integration of qualitative and quantitative methods, whereby qualitative findings inform the design and focus of subsequent quantitative research. In this study, a focus group discussion serves as the exploratory qualitative technique, providing essential insights that shape the questionnaire used in the quantitative phase to collect comprehensive data.

H. Qualitative Approach: Focus Group Discussion

The qualitative component of this research utilizes a focus group methodology. [21] describe a focus group as a gathering of individuals selected by the researcher to discuss a specific topic based on their personal experiences. This method is particularly useful for generating hypotheses, exploring attitudes and opinions, and identifying key themes that inform subsequent stages of research. Focus groups have been recognized for their effectiveness in gathering the perspectives of various stakeholders within a short period, facilitating rapid analysis and interpretation of data [22] also highlights the exploratory nature of focus groups, emphasizing their ability to generate rich qualitative data in a relatively quick manner.

In this study, the focus group was conducted as a two-day workshop, with the primary goal of developing Key Performance Indicators (KPIs) for academic staff at ATBU Bauchi for a specified academic period. The workshop participants included academic staff from various faculties and departments, representing a wide range of designations. Faculty members from different academic ranks were selected to ensure a fair representation across the institution.

I. Participant Selection and Grouping

Participants in the workshop were academic staff from all faculties at ATBU Bauchi. These faculties included the Faculty of Management Sciences, Faculty of Engineering, Faculty of Environmental Technology, Faculty of Science, Faculty of Technology Education, and

Faculty of Medical Sciences. The selection process aimed to achieve a balanced representation of staff from various academic ranks, including graduate assistant, lecturer I and II, senior lecturers, associate professors, and Professors. In addition, administrative roles such as Deputy Deans and Heads of Departments (HODs) were also represented, providing a holistic view of academic performance management. The breakdown of participants by designation and role is shown in Table 1 below:

Table 1: The breakdown of participants by designation

Designation/Post	Number of Participants
Deputy Dean	4
HOD	5
Professor	4
Associate Professor (Reader)	5
Senior Lecturer	6
Lecturer II	8
Lecturer I	10
Graduate Assistant	13
Total	55

The focus group was divided into four smaller groups, each comprising 11 to 12 members, in line with recommendations from [23] on the ideal focus group size. This arrangement ensured that all participants could actively engage in discussions and share their perspectives. The groups were re-arranged at several points during the workshop to maximize interaction between participants and ensure diverse viewpoints were considered.

J. Workshop Design and Data Collection

The workshop followed a multi-session design aimed at collecting the necessary data for the research. During the sessions, participants worked within their groups to discuss and develop potential KPIs. Each group was tasked with generating ideas and providing feedback on the proposed indicators for academic staff performance. To encourage cross-group collaboration, the participants were reshuffled during specific sessions, allowing them to interact

Corresponding author: Abdulsalam Ya'u Gital

✉ musbaida@gmail.com

Department of Computer Science, Abubakar Tafawa Balewa University, Bauchi.

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with members from other groups and contribute to a better-rounded and informed discussion.

Moderation of the workshop was a key aspect of the process. As outlined by [24], effective focus group sessions require a skilled moderator to guide the discussion and manage group interactions. In this study, the principal researcher served as the primary moderator, with assistance from a co-moderator, ensuring that the discussions remained focused and productive.

The preparation for the workshop involved extensive groundwork, including the gathering of background information, preparing presentation materials, and developing data collection forms. These materials were designed to guide the discussions and ensure that relevant data was collected efficiently. Additionally, a framework for summarizing and analyzing the data was established, providing a clear structure for separating and integrating the qualitative and quantitative findings.

K. Quantitative Approach: Questionnaire Design

Following the focus group sessions, the data collected informed the design of a comprehensive questionnaire, used to gather quantitative data from a larger sample of academic staff. The questionnaire was carefully structured to include items derived from the focus group discussions, ensuring that the KPIs developed during the workshop were adequately represented and could be evaluated on a broader scale.

The quantitative phase of the study allowed for statistical analysis of the data, providing measurable insights into the effectiveness of the proposed KPIs. This approach enabled the researcher to validate the qualitative findings and assess the overall applicability of the performance indicators across different academic roles and faculties.

L. Process Flow for Determination of Key Performance Indicators for Academic Staff

The flow of activities for the workshop is outlined in **Figure 1** below.

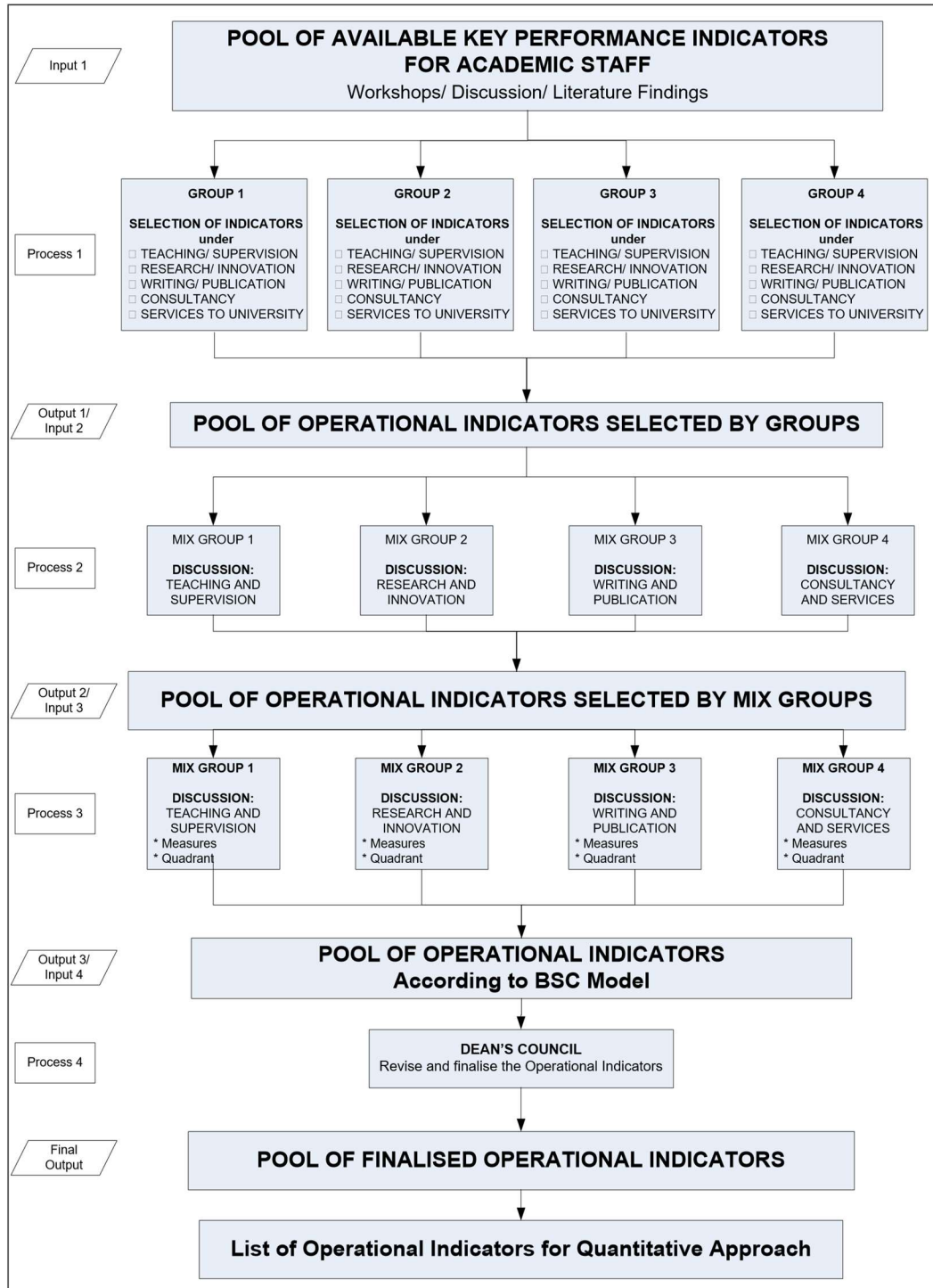
The first step in this process involves focus group participants selecting operational performance indicators from a predefined list. This list was carefully developed based on the findings from previous workshops on academic staff performance evaluation and an extensive review of the relevant literature. By integrating both workshop outcomes and literature review, the aim was to ensure that the list provided a comprehensive representation of the most relevant and effective indicators for measuring academic staff performance. The operational performance indicators were classified under five major categories, which are as follows:

1. Teaching and Supervision
2. Research and Innovation
3. Writing and Publication
4. Consultancy
5. Service to the University

Table 2 presents the full range of performance indicators available for academic staff, including detailed measures for each category.

M. Selection and Refinement of Operational Indicators for Academic Staff Performance Measurement

Each group is tasked with selecting five operational indicators that best align with each category of the headline indicators: Teaching and Supervision, Research and Innovation, Writing and Publication, Consultancy, and Services. The process begins with group discussions (referred to as Initial Group) to evaluate the suitability of the indicators provided.



Corresponding author: Abdulsalam Ya'u Gital

✉ musbaida@gmail.com

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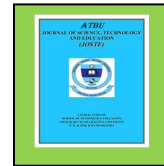


Figure 1: Process Flow for Determining Key Performance Indicators for Academic Staff – Qualitative Approach

Table 2: Pool of Available Key Performance Indicators for Academic Staff

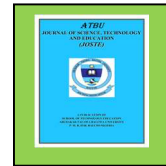
KPI	MEASURES
TEACHING AND SUPERVISION	a) Number of credit hours
	b) Number of subjects
	c) Number of students
	d) Number of new/old subjects
	e) Level of subjects
	f) Teaching portfolio
	g) Student's satisfaction
	h) Superior ratings
	i) Peer ratings
	j) Self-Evaluation
	k) Teaching load for Undergraduate subjects
	l) Teaching load for Postgraduate subjects
	m) Implementation of syllabus according to schedule and plan
	n) Availability for discussion/consultations with students
	o) Quality of teaching materials
	p) Ability to teach multi- discipline subjects
	q) Number of projects supervision
	r) Number of postgraduate supervisions
	s) Completion within deadline
t) Academic advising-frequency of meetings	
u) Marks/Grade given for projects supervised	
v) External recognitions obtained for the supervised work	
KPI	MEASURES
RESEARCH AND INNOVATION	a) Science Fund – Head
	b) Science Fund – Member
	c) University – Head
	d) University – Member
	e) International – Head
	f) International – Member
	g) Industry – Head
	h) Industry – Member
	i) Initiator/Idea
	j) Project Proposal/ Writing
	k) Defense of Proposal/ Presentation

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✉ musbaida@gmail.com

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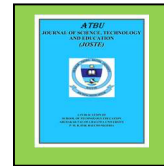
	l)	Evidence of ability to drive innovations in T & L
	m)	“Impact” factor
	n)	Total funding attracted
	o)	Applicability of research
	p)	Number of projects ongoing
	q)	Range of industries accessing research outputs
	r)	Extent of multi-disciplinary research
	s)	Proportion of publications from new areas
	t)	Number of successful collaborations
	u)	Number of recognitions by external parties
	v)	Number of project completion
	w)	Intellectual property: Patent/ copyright/ Design/ Trademark
	x)	Commercialization: Products to industry/ Technology licensing
KPI		MEASURES
WRITING AND PUBLICATION	a)	Publications in refereed international journals (academic or professional)
	b)	Publications in refereed national journals (academic or professional)
	c)	Publication – Research Book / Monograph
	d)	Publication – Book chapters
	e)	Publication – Text books
	f)	Publication – Software that has been generally circulated
	g)	Publication – other generally circulated publication
	h)	Publication – Cases that have been generally circulated
	i)	Published proceedings of International Conferences
	j)	Published proceedings of National Conferences
	k)	Pre-prints, Translations
	l)	Abstract / Conference Presentation and Poster (not published) / Book Review / Technical Reports
	m)	Presentations at International Conferences
	n)	Presentations at National Conferences
	o)	Manuscripts accepted for presentation at College level “working paper series”
	p)	Presentations of written Research Proposal at “faculty/departmental research workshop”
	q)	Teaching Modules
r)	Professional/Creative Outputs	
s)	Consultancy Proposal	
t)	Short Courses Proposal	
u)	Newsletters Technical Report	

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✉ musbaida@gmail.com

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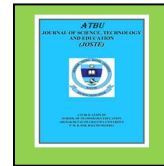
	v)	Newsletters Bulletin
	w)	Magazines and Newspapers Article
	x)	Departmental Report
	y)	Non-academic publications
KPI		MEASURES
CONSULTANCY	a)	Value (RM) of consultancy work
	b)	Number of external consultancy work
	c)	Number of recognitions by external parties
	d)	Normalized Equivalent Man-hour
	e)	Number of Short Courses
	f)	Number of Industrial Services
	g)	Appointment as expert/ advisor by external bodies or other Institutions
	h)	Invitations to offer views in meetings, conferences, and others (academically or professionally)
	i)	Industrial Attachments > 6 months
	j)	Number of courses/workshops conducted for sharing of knowledge at university's level
KPI		MEASURES
SERVICES	a)	Evidence of the academician's contribution to helping the university gain recognition for its awards by professional bodies
	b)	Evidence of important administrative duties performed
	c)	Evidence of income generation for the university through external funding (sponsorship, etc)
	d)	Member of professional bodies
	e)	Ordinary member of professional affiliation
	f)	Office bearers at national level
	g)	Office bearers at international level
	h)	Paper reviewer
	i)	Achievements in professional conducts that are recognized by experts in the areas
	j)	Member of Advisory Panel for Higher Learning Institution
	k)	Speakers in talks/forums (academically or non- academically)
	l)	Judge
	m)	Examiners
	n)	LAN assessors
	o)	Committee member at University level - Chairperson
p)	Committee member at University level – Ordinary member	
q)	Committee member at College level - Chairperson	
r)	Committee member at College level - Ordinary member	
s)	Involvements in sports and other curricular activities	

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✉ musbaida@gmail.com

Department of Computer Science, Abubakar Tafawa Balewa University, Bauchi.

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	t) Awards received at University/College levels
	u) Visiting Academic / Fellowship
	v) Referee Articles/Journals/Academic Papers
	w) Editorial Board
	x) Seniority after 5 years
	y) Service to community

Process 1: Selection of Initial Indicators

After discussions, the outcomes from the four Initial Groups are compiled and categorized by the five headline indicators. Each group selects five operational indicators per category, resulting in 20 indicators per category (5 indicators per category × 4 groups).

Process 2: Reselection of Indicators

In this stage, the selected operational indicators from Process 1 are reviewed by different groups with new compositions (referred to as Mix Groups). The purpose of this rearrangement is to encourage broader discussions on all 20 operational indicators and facilitate a smoother process. Each Mix Group focuses on one category, with one group covering two categories. The headline indicator assignments for Mix Groups are as follows:

- a) **Mix Group 1:** Teaching and Supervision
- b) **Mix Group 2:** Writing and Publication
- c) **Mix Group 3:** Research and Innovation

d) **Mix Group 4:** Consultancy and Services

Each group ultimately selects five operational indicators for their assigned category. These indicators are then recorded on a form distributed to all groups.

Process 3: Finalization of Indicators Using the Balanced Scorecard (BSC) Framework

In the final process, the Mix Groups further refine their selected operational indicators using the Balanced Scorecard (BSC) model. BSC is a strategic framework developed by David Norton and Robert Kaplan that classifies performance measures into four perspectives: Financial, Customer, Internal Processes, and Learning & Growth. The goal is to ensure that all selected indicators align with these perspectives and provide a comprehensive measure of performance. In total, nineteen KPI measures were identified in the workshop. This is shown in Table 3 below.

Table 3: KPI Measures for Academic Staff

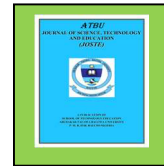
KPI INDICATORS		OPERATIONAL INDICATORS
TEACHING AND SUPERVISION	1	Teaching Load
	2	Teaching Evaluation
	3	Supervision / Consultation
	4	Quality of Teaching
	5	Co-curriculum Involvement
RESEARCH AND INNOVATION	1	Approved Research Project
	2	Involvement
	3	Successful Collaboration
	4	Project Completion

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✉ musbaida@gmail.com

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	5	Research Fund – Amount of Grant
KPI INDICATORS		OPERATIONAL INDICATORS
WRITING AND PUBLICATION	1	Academic Paper
	2	Other Writing
KPI INDICATORS		OPERATIONAL INDICATORS
CONSULTANCY	1	Involvement
	2	Amount of Monetary Value
	3	Industrial Attachment / Advisory Role
KPI INDICATORS		OPERATIONAL INDICATORS
SERVICES	1	Committee Involvement
	2	Professional Bodies and membership
	3	Reviewer or Internal / External Examiner
	4	Community and Voluntary Services

After thorough discussions based on the workshop's outcomes, including the selected KPI measures, the 19 operational indicators were reduced to 14 final indicators.

Table 4: Operational Indicators for Academic Staff

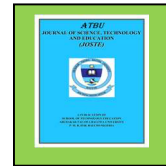
Headline Indicators		Operational Indicators
Teaching And Supervision	1	Teaching Load
	2	Supervision
	3	Quality Of Teaching
	4	Co-Curriculum Involvement
Headline Indicators		Operational Indicators
Research	1	Approved Research Project
Headline Indicators		Operational Indicators
and Innovation	2	Level Of Involvement
	3	Project Completion
	4	Research Fund
Headline Indicators		Operational Indicators
Writing and Publication	1	Academic Paper
	2	Other Writing
Headline Indicators		Operational Indicators
Consultancy	1	Involvement
	2	Industrial Attachment / Advisory Role
Headline Indicators		Operational Indicators
Services	1	No of Committee / No of Community & Voluntary Services

Corresponding author: Abdulsalam Ya'u Gital

✉ musbaida@gmail.com

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	2	No of Professional Bodies / No of Reviewer / External Examiner
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METHODOLOGY PHASE 2

The outcomes of the group discussions were used to develop a questionnaire tailored for this research. A preliminary questionnaire was designed to assess the favorability of the newly proposed Key Performance Indicators (KPIs) across the organization. Each KPI indicator encompasses several operational indicators, which respondents were required to rate based on their favorability, ranging from "less favorable" to "most favorable." A five-point Likert scale was adopted to capture these linguistic terms effectively.

While traditional studies often utilize statistical techniques such as means, percentages, standard deviations, measures of central tendency, correlation coefficients, chi-square tests, and regression analysis for data evaluation, this research employed an alternative approach—fuzzy set theory. This method provides a novel way of representing linguistic terms within the Likert scale. The fuzzy inference system, expressed in terms of membership value degrees, is particularly advantageous for indicating the degree of favorability.

The fuzzy set theory, initially introduced by Zadeh in 1965, addresses the inherent imprecision in subjective evaluations that classical set theory cannot handle. Gupta (1998) demonstrated that fuzzy sets and membership

values are effective tools for modeling vague and subjective concepts in evaluative contexts. For instance, fuzzy models have been applied in multi-objective decision-making for job assignment salary structures (Gupta, 1998) and personnel evaluations in large organizations (Cannavacciuolo, 1994).

N. Data Collection and Analysis

The research instrument for this study was a structured questionnaire that included four main KPI indicators with a total of fourteen operational indicators to gauge the favorability of the KPIs among academic staff at Abubakar Tafawa Balewa University (ATBU), Nigeria. A total of 100 questionnaires were distributed randomly among academic staff members during a university-organized workshop on Academic Performance Measurement held on [insert date]. Out of the total, 70% of the questionnaires were completed and returned for analysis. No pre-selection criteria were applied; the questionnaires were distributed randomly to participants present in the lecture hall where the workshop was conducted. The respondents were requested to provide demographic information, including their gender, faculty within the university, academic position, and years of work experience. Table 5 outlines the demographic profile of the respondents.

Table 5: The demographic data of the respondents

Designation	Male	Female	Science	Comp.	Eng.	Mgt. Sci.	Others	<3 yrs	3 - 5 yrs	5 - 10 yrs	10 & above
Deputy Dean	3	1	1	1	1	1	0	1	1	1	1
HOD	4	2	1	1	1	1	2	1	2	1	2
Prof.	8	4	3	2	1	2	4	0	2	3	7
Ass. Prof. (Reader)	5	3	2	2	1	1	2	1	1	2	4
Senior Lecturer	12	6	4	3	3	3	5	2	3	4	9
Lecturer I	10	5	3	3	2	3	4	2	3	4	6
Lecturer II	8	4	2	2	2	3	3	3	3	2	4
Graduate Assistant	6	3	1	2	1	1	4	4	2	1	2

Corresponding author: Abdulsalam Ya'u Gital

✉ musbaida@gmail.com

Department of Computer Science. Abubakar Tafawa Balewa University, Bauchi.

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TOTAL	56	28	17	16	12	15	24	14	17	18	35
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In this study, data from 70 respondents were analyzed. The gender distribution showed that 56 respondents (80%) were male, while the remaining 28 (20%) were female. Designation-wise, the respondents included 4 deputy deans, 6 HOD's, 12 professors, 8 Associate Professors, 18 Senior Lecturers, 15 Lecturers I, 12 Lecturer II, and nine graduate assistants. Additionally, five respondents did not specify their positions.

Regarding years of experience, a significant proportion of the respondents (26%) reported having 5–10 years of professional experience, while 45% had over 10 years of experience. A similar percentage (25%) had less than three years of experience, and the remaining 15% had 3–5 years of experience.

The study adopted a structured methodology to evaluate the Key Performance Indicators (KPIs) for academic staff performance, leveraging a Fuzzy Conjoint Model combined with Tucksen Conjoint Fuzzy Medal and Biswas Model. This approach offers a de-compositional analysis, breaking down the overall preference for an indicator into its individual components, enabling a more nuanced understanding of the factors influencing performance.

The Fuzzy Conjoint Model integrates fuzzy measurements into the vector preference model. The preference for a specific KPI is expressed as a weighted sum of its attribute ratings. Mathematically, the model is represented as:

$$R(A) = \frac{\sum_{i=1}^k W_i \cdot \mu_R(y_i, A)}{\sum_{i=1}^k W_i}$$

Where:

- a) R(A): Overall evaluation of KPI AAA.
- b) W_i : Weight assigned to the i^{th} attribute (on a scale of 1–5).
- c) $\mu_R(y_i, A)$: Membership function evaluating the i^{th} attribute against linguistic labels.

- d) k: Total number of attributes.
- e) y_i : Linguistic labels assigned to A, ranging from "less favorable" to "most favorable."

To quantify preferences, attributes were rated using a 5-point Likert scale ranging from 1 (Less Favorable) to 5 (Most Favorable) as shown below:

Table 6: Likert Scale for the Linguistic Value

Element	Linguistic Value
1.00	Less Favorable
2.00	Slightly Favorable
3.00	Quite Favorable
4.00	Favorable
5.00	Most Favorable

O. Ranking KPIs Using the Fuzzy Model

The hierarchy of linguistic decisions was established by calculating the similarity degree of fuzzy sets for each KPI measure. When multiple KPIs shared the same linguistic value (e.g., "Favorable"), the ranking was determined based on their fuzzy set similarity scores. Higher similarity values indicated a higher priority. The analysis revealed the most preferred Operational Indicators, with the outcomes ranked based on their linguistic value and fuzzy scores. This ranking enables academic institutions to prioritize specific KPIs to enhance staff performance effectively. By focusing on the most favorable indicators, this study provides actionable insights to optimize performance measurement frameworks.

P. Fuzzy Prioritization of Key Performance Indicators

The Key Performance Indicators (KPIs) for academic staff performance were evaluated using a Fuzzy Conjoint Model. Below is the consolidated table of the operational indicators, their fuzzy values, ratings, linguistic values, and rankings:

Table 7: Prioritization of Key Performance Indicators Using Fuzzy Conjoint Model

Corresponding author: Abdulsalam Ya'u Gital

✉ musbaida@gmail.com

Department of Computer Science, Abubakar Tafawa Balewa University, Bauchi.

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KPI Indicator	Operational Indicator	Fuzzy Value	Rating	Linguistic Value	Rank
Teaching and Supervision	Teaching Load	0.9792	4	Favorable	1
	Supervision/Consultation	0.9302	4	Favorable	2
	Quality of Teaching	0.9278	4	Favorable	3
	Co-curriculum Involvement	0.9210	3	Quite Favorable	4
Research and Innovation	Research Project	0.9645	4	Favorable	1
	Research Involvement	0.9453	4	Favorable	2
	Research Output	0.8974	4	Favorable	3
	Research Fund	0.8677	4	Favorable	4
	Writing Academic Paper	0.9735	4	Favorable	1
	Other Writing	0.8914	4	Favorable	2
Consultancy	Consultancy Involvement	0.9289	4	Favorable	1
	Industrial Attachment/Advisory Role	0.8619	3	Quite Favorable	2
Services	Membership in Professional Bodies/Reviewer/Examiner Roles	0.9070	4	Favorable	1
	Committee Involvement/Community and Voluntary Services	1.0000	2	Slightly Favorable	2

DISCUSSION

The findings indicate the prioritization of KPIs based on the core responsibilities and perceived importance among academic staff. Teaching Load was ranked the highest, reflecting its primary importance as a quantifiable and central duty of academic staff. Supervision and consultation also scored highly, highlighting the mentorship aspect of academia. Co-curricular involvement ranked the lowest, emphasizing its auxiliary role compared to teaching responsibilities.

Research Project ranked highest in this category, indicating a strong preference for engaging in funded and impactful research. Research Involvement and Output followed, showing the importance placed on active participation and tangible results. Writing academic papers was rated above other types of writing, aligning with the institutional emphasis on peer-reviewed publications.

Consultancy involvement was rated higher than industrial attachment/advisory roles. This suggests that academic staff prioritize activities directly contributing to their professional and institutional goals over external engagements, possibly due to limited opportunities for such roles.

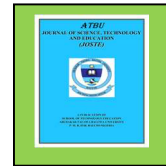
Membership in professional bodies and roles such as reviewers or examiners were favored over committee involvement or community services. This reflects the perception that professional memberships and external reviews are more critical to academic career advancement than voluntary activities.

The analysis demonstrates that academic staff preferences align closely with their core job functions—teaching, research, and publication. Peripheral roles like community services and co-curricular activities are less favored, highlighting the need for performance evaluations to focus on fundamental academic responsibilities.

Future research should extend this study to a broader sample, incorporating diverse institutions and exploring quantitative methods to assess each operational indicator's contribution to academic performance.

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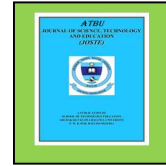
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Corresponding author: Abdulsalam Ya'u Gital

✉ musbaida@gmail.com

Department of Computer Science, Abubakar Tafawa Balewa University, Bauchi.

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Corresponding author: Abdulsalam Ya'u Gital

✉ musbaida@gmail.com

Department of Computer Science, Abubakar Tafawa Balewa University, Bauchi.

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