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Impact of TPaCK on the Behavioural Intention to Use Blended Learning among Northern Nigerian University Lecturers

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Abstract

The purpose of this study is to determine how the Technological, Pedagogical, and Content Knowledge (TPaCK) of Northern Nigerian university lecturers impact their behavioural intention to use blended learning. The study uses a quantitative methodology in the form of a survey research design with a sample of 455 university lecturers to evaluate the impact of TPaCK on lecturers' intentions to incorporate blended learning into their instruction. The results show a statistically positive significant correlation between lecturers' behavioural intention to use blended learning across the three major TPaCK components with an individual prediction ability of Technological Knowledge contributing 31.6%, Pedagogical Knowledge contributing 42.1%, and Content Knowledge 34.5% and a combined predictive ability of the TPaCK at 45.4%. These findings highlight the significance of TPaCK as a vital foundation for improving teaching strategies and encouraging the sensible application of technology in higher education. For administrators and policymakers hoping to promote more digitally integrated education in universities in Northern Nigeria, the study offers insightful information.

Keywords: *Blended Learning, Technological-Pedagogical-Content Knowledge, Behavioural Intention, and University Lecturers.*

Introduction

Technology integration into the classroom is now a must for modern instruction. Technological Pedagogical Content Knowledge (TPaCK) integrates technology, pedagogy, and content knowledge to improve the efficacy of instruction. Mishra and Koehler (2006) proposed that in 21st-century learning environments, teachers should possess significant expertise in Technology Pedagogy and Content Knowledge (TPaCK). Teachers' proficiency in TPaCK is crucial for blended learning, which is a mode of instruction that combines traditional classroom instruction with online learning resources (Dakhi, Jama & Irfan, 2020). The effectiveness of blended learning, which is still relatively new in Northern

Nigeria, hinges on how prepared and willing university teachers are to effectively incorporate these technologies (Bubou, & Job, 2022).

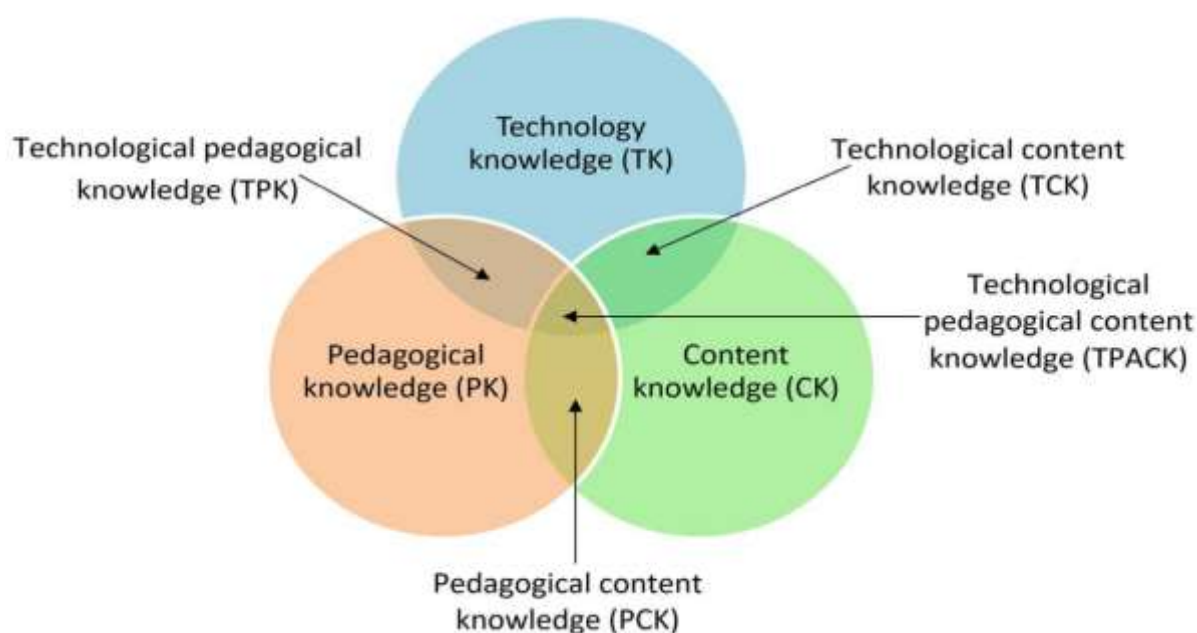
Despite blended learning's potential advantages, a lack of technological knowledge and pedagogical knowledge causes many university lecturers in Nigeria to struggle with its implementation (Obada, et al. 2023).

Technological Pedagogical Content Knowledge

Teachers in the twenty-first century need to be proficient in using technology to appropriately integrate pedagogy and subject matter (Bilici, Yamak, Kavak, & Guzey, 2013). Mishra & Koehler (2006), introduced the Technological Pedagogical Content Knowledge (TPaCK) paradigm, (Koehler, & Mishra, 2009) incorporates technology into the framework, extending Shulman's (1987) idea of Pedagogical Content Knowledge (PCK). This model captures the complexity of the fundamental information that educators need to know. It is regarded as a body of knowledge that clarifies how teachers can successfully use technology in the classroom. Kumar and Ahmad (2022). Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), Content Knowledge (CK), Pedagogical Knowledge (PK), Technological Knowledge (TK), and Technological Pedagogical Content Knowledge (TPaCK) are the seven components that make up TPaCK. These seven components indicate the different tactics that teachers plan to use in the classroom to enhance education and learning.

The three primary TPaCK components constitute the study focus for this investigation, and they are as follows: Technological Knowledge (TK): Evaluate how lecturers' readiness to use blended learning is influenced by their comfort level and confidence with technology. Pedagogical Knowledge (PK): Analyse how instructional techniques and tactics support the incorporation of blended learning. Content Knowledge (CK): Examine how subject-matter expertise affects the efficient use of blended learning.

This paradigm emphasizes the intricate relationship that exists between pedagogy, content, and technology, underscoring the need to comprehend these relationships to effectively educate with technology and improve learning results. Their intersection is as in below figure.



Adopted from Mishra, & Koheler (2012) - Components of Technological, Pedagogical, Content Knowledge

Blended Learning

Blended learning is the term used to describe a solution that combines several distribution modalities, such as web-based courses, knowledge management approaches, electronic performance support systems (EPSS), and collaboration software (Bansal, 2014). Blended learning (BL) is the term used to describe learning that integrates various event-based activities, such as live online courses, self-paced training, and in-person classes. Oghenevwede (2015) quoted Friesen (2012) as "Blended learning" describes the range of possibilities that result from combining digital and online media with traditional classroom forms, which demand the physical presence of both the teacher and students for learning to take place. In higher education, blended or hybrid learning is a trendy, yet relatively new concept. Blended learning could be gained by adopting one of the learning theories that identifies the beginning point of the research, just as other learning styles. It is crucial to convey how students learn and the blended learning styles in connection to the mixed learning environment while designing and developing the blended learning model with a focus on pedagogical concepts.

Behavioral Intention to Use Blended Learning

Behavioural intention is the behavioural readiness to accept, utilize, or adopt a system. Decision-makers can better accept and implement blended learning in Nigerian universities if they have a thorough understanding of this new framework and can use the study's findings to direct policies that

influence teachers' behavioural intentions to use blended learning. This will help determine why teachers are either accepting or resisting blended learning in the future or are accepting of it.

Literature Review

Counts of studies were conducted in respect of TPaCK and behavioural intention to use technology by researchers. Some of the prominent research are those by Chaipidech, Srisawasdi, Kajornmanee, & Chaipah, (2022) which showed that teacher preparation in digital teaching abilities, such as TPaCK, is essential for the successful implementation of blended learning. A study by Khong, Celik, Le, Lai, Nguyen, & Bui (2023) has shown how instructors' behavioural intention to teach online after the pandemic was affected by the combined effects of TPaCK, perceived usefulness (PU) of technology, and innovativeness.

Cheung, Wan, & Chan, (2018) conducted a study to investigate the differences in Students' Response System (SRS) adoption efficiency and the study also highlighted the significance of technological-pedagogical and technological-content knowledge for additional research to advance technology adoption with these highlighted TPaCK configurations and assist frontline academics regarding the fusion of technology and pedagogy.

Pitchanadejanant and Nontakao (2015) carried out a study to update and expand on UTAUT factors that influence in-service upper-secondary level teachers' behavioural intentions when utilizing technology. The extended determinants of the UTAUT model include technological pedagogical content knowledge (TPaCK), ICT professional development (ICTPD), availability (A), technical assistance (TA), and computer self-efficacy (EL). The determinants are attitude and computer self-efficacy. And the results show that attitudes, TPaCK, and ICTPD have a direct influence on upper secondary level teachers' behavioural intentions to use technology.

Mohammad-Salehi, Vaez-Dalili, & Heidari Tabrizi (2021) investigated factors influencing Iranian English as First Language (EFL) teachers' adoption of Web 2.0 technologies in light of UTAUT and TPaCK theoretical frameworks while other factors of UTAUT affect the adoption of the EFL TPaCK was insignificant.

An, et al. (2023) examined the views, knowledge, and behavioural intention of EFL teachers to employ AI to enhance English teaching and learning in middle schools. As its theoretical foundation, the study included pertinent elements of the Technological Pedagogical and Content Knowledge (TPaCK) and the Unified Theory of Acceptance and Use of Technology (UTAUT). Based on the measured criteria, the results indicated that the EFL teachers had a good attitude. AIL-TK, AI-TPaCK, PE, and SI all had a strong positive prediction ability on behavioural intention.

Bai, Guo, and Gu (2024) used the primary aim of this study to examine how teachers' comprehension of technological pedagogical content knowledge (TPaCK) affects their behavioural intention to use technology by taking into account their attitude towards technology use and technology self-efficacy in a chain mediation model. According to the findings, there is a relationship between TPaCK and the behavioural intention to use technology and teachers' attitudes and self-efficacy in using technology

play an important independent mediating role in that relationship. Additionally, there is a chain mediating effect between TPaCK and the behavioural intention to use technology.

According to research by Qasem and Viswanathappa (2016), training science instructors using a blended learning strategy greatly improved their TPaCK competencies, which may have a beneficial effect on their instructional strategies.

These findings highlight how crucial it is to incorporate TPaCK into professional development courses to help teachers become more proficient in blended learning delivery. Several research works have investigated the use of TPaCK in blended learning settings, but not to our reach, a study that has investigated the impact of TPaCK on the behavioural intentions of northern Nigerian university lecturers to use blended learning. Thus, a gap to be filled in by this study.

Statement of the Problem

The following problems, according to Eze et al. (2018), keep many higher education institutions in Nigeria from properly using virtual learning resources: operators' insufficient or nonexistent training. This study aims to determine how TPaCK affects these lecturers' behavioural intention to adopt and use blended learning.

Understanding the impact of the various TPaCK (Technological, Pedagogical, and Content Knowledge) components on university lecturers' readiness to adopt blended learning strategies in their instruction was the main goal of this study. Equally, by examining the association between the combined influence of TPaCK competence and university lecturers' behavioural intention to use blended learning, it examined how TPaCK proficiency might help overcome obstacles to blended learning adoption in Nigerian universities.

The bulk of Nigeria's educational system is built on traditional teaching and learning methodologies that are focused on the physical learning environment. But as with most impoverished nations, Nigeria's traditional educational system has its flaws, which have been exposed by the COVID-19 pandemic. In terms of social, economic, and, more recently, technological exploration, colleges in less developed nations lag behind those in wealthy nations (Alabi, 2016; Nyirungu, 2009). Out of Nigeria's more than 170 universities, only 11 have operational virtual learning platforms, and most of the rest are still inadequately prepared (Alabi, 2016). Constant power interruptions and internet accessibility are two external issues that make e-learning assessment difficult (Klenowski, 2011; Mafenya, 2016).

This shows that in Nigeria and other developing countries where the internet and power supply are unorganised or may be divided based on socioeconomic class, blended learning during a pandemic may not be possible. Teachers and students in our post-secondary institutions may be against its implementation because of this.

The use of blended learning presents particular obstacles for universities in Northern Nigeria. These consist of infrastructure limitations, instructors' differing degrees of digital literacy, and restricted access to technology resources. According to Ifinedo, Rikala, and Hämäläinen's (2020) study, Nigerian educators generally showed less positive attitudes toward the use of technology than their international counterparts. Targeted interventions to enhance TPaCK competencies and support mechanisms that enable the deployment of blended learning in these institutions are necessary to address these issues.

Significance of the Study

The study sheds light on how well TPaCK works to encourage blended learning among Northern Nigerian university lecturers. The results of this study will aid policymakers and educational administrators in formulating plans to improve lecturers' technological and pedagogical proficiency, which will raise educational standards. The study also adds to the body of knowledge already available on blended learning and TPaCK in the context of rising nations.

The objective of the study is to:

To explore the (independent and combined impact of) relationship between Technological, Pedagogical, and Content Knowledge and lecturers' behavioural intentions to use blended learning.

Hypotheses:

- 1-Technological knowledge significantly influences the behavioural intention of northern Nigerian university lecturers to use blended learning.
- 2-Pedagogical knowledge significantly influences the behavioural intention of northern Nigerian university lecturers to use blended learning.
- 3- Content knowledge significantly influences the behavioural intention of northern Nigerian university lecturers to use blended learning.
- 4- Technological, Pedagogical and Content Knowledge (TPaCK) significantly influence the behavioural intention of northern Nigerian university lecturers to use blended learning.

Research Methodology

A survey research design was employed for the study. The study employed a stratified random sampling technique to ensure representation from a range of fields and institutions. Specifically, the sample consisted of lecturers from management sciences, sciences, and education backgrounds at three private, three state, and three federal northern Nigerian universities. There were 455 lecturers who made the sample and were chosen at random.

To gather information on the TPaCK levels and behavioural intentions of the chosen lecturers, two self-constructed scales; the Technology Acceptance (TA) Scale and the Behavioural Intention to Use Blended Learning (BIUBL) Scale were administered to the subjects via Google Forms and paper copies. Five Likert-scale items made up the scales, which were designed to test several characteristics associated with technology acceptance, TPaCK, and behavioural intention to use blended learning.

The study's hypotheses were tested using the SPSS software to determine the significance of the correlations between TPaCK components and behavioural intention. They were ascertained, using inferential statistics. Linear and Multiple regression analyses were used to determine the individual relationships and evaluate the combined impact of the three major TPaCK components on behavioural intention respectively.

Results and Interpretations

The following hypotheses results show how the three components of TPaCK; Technological, Pedagogical, and Content Knowledge as well as its combined impact on the university lecturers' behavioural intention to use blended learning in northern Nigeria;

The technology acceptance scale and behavioural intention to use the blended learning scale were filled by university lecturers (N = 455) from Universities in Northern Nigeria.

1.1 Impact of Technological Knowledge (TK) on the Behavioural Intention to Use Blended Learning (BIUBL) in Higher Education among University Lecturers

The technology acceptance scale and behavioural intention to use blended learning scale were filled by university teachers (N = 455) from Universities in Northern Nigeria.

Results About Influence of Technological Knowledge (TK) on the Behavioural Intention to Use Blended Learning in Higher Education among University lecturers

To analyse the relationship between technological knowledge and the behavioural intention of university lecturers to use blended learning in higher education, a scale pertaining to technology acceptance and behavioural intention to use blended learning was administered and data were generated, the r-value was calculated using the Pearson Product Moment Correlation Method. The results are shown below in table 1.1

H_a: Technological knowledge has a significant influence on the behavioural intention of northern Nigerian university lecturers to use blended learning in higher education.

Relationship Between Technological Knowledge (TK) and Behavioural Intentions To Use Blended Learning (BIUBL) in Higher Education among University Lecturers

Variables	N	df	r-value	Remark
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Technological knowledge	455	453	.562**	P = .000 < .01
Behavioural intentions to use blended learning				

Critical values of r ($df=453$) at 0.05 and 0.01 level of confidence are 0.088 and 0.115 respectively.

INTERPRETATION

Data presented in Table 1.1 above indicate that the value of Pearson Product Moment Correlation Coefficient between Technological knowledge and behavioural intention is .562. This value of correlation (.562) is positive and statistically significant at both levels of confidence. Thus, the stated hypothesis that; Technological knowledge has a significant influence on the behavioural intentions of university lecturers to use blended learning in higher education is retained.

Influence of Technological knowledge (TK) on the Behavioural Intention to Use Blended Learning (BIUBL) in Higher Education among University Lecturers

Linear regression analysis was applied to the collected data to see the influence of Technological knowledge on the behavioural intention of university lecturers to use blended learning in higher education. The results are presented below in Tables 1.2 and 1.3 respectively.

Table-1.2

Model and ANOVA Summary for Technological Knowledge (TK) as Contributor of Behavioural Intention to Use Blended Learning (BIUBL) in Higher Education among University Lecturers

The objective was to analyse the influence of technological knowledge on the behavioural intention of university lecturers to use blended learning in higher education. Regression has been computed and results are presented below in Tables 1.2 and 1.3 respectively.

H_a: Technological knowledge has a significant influence on the behavioural intention of northern Nigerian university lecturers to use blended learning in higher education.

Table-1.2-Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.562	.316	.314	3.57

Table-1.3 –ANOVA Summary

Model	Sum of Squares	df	Mean Square	F	Sig.
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Regression	1843.97	1	2677.975	209.106	0.000
Residual	6635.49	453	12.807		
Total	8479.46	454			

Interpretation

It is clear from the regression tables 1.2 and 1.3 above that technological knowledge yielded a coefficient regression (R) of .562 and an R square for the same found to be .316. This indicates that a 31.6% variation in behavioural intention to use blended learning in higher education among university lecturers is explained by technological knowledge in the model. The variation of 31.6% is significant at (0.01) level of significance. So, it is evident from Table 1.2 (R square = .316) that only 13.9% of the behavioural intention to use blended learning in higher education has been explained by technological knowledge in the case of university lecturers. Therefore, a 13.9% variation in the behavioural intention to use blended learning in higher education is explained by the independent variable (Technological knowledge), and a 68.4% variation in the behavioural intention to use blended learning in higher education is explained by other variables.

Table-1.4 Coefficients of Regression

Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	17.095	1.087	-	15.734	0.00
Technological Knowledge	.434	.030	.562	14.460	0.00

Interpretation

From Table 1.4 of coefficients of regression, the regression equation is behavioural **intention to use blended learning in higher education** = 17.095 + .434 (Technological Knowledge).

So, with a unit increase in technological knowledge, there will be .434 times increase in the behavioural intention of university lecturers to use blended learning in higher education.

Hence the stated hypothesis; that technological knowledge has a significant influence on the behavioural intention of university lecturers to use blended learning in higher education, is accepted.

2.1 Impact of Pedagogical Knowledge (PK) on the Behavioural Intention to Use Blended Learning (BIUBL) in Higher Education among University Lecturers

The technology acceptance scale and behavioural intention to use blended learning scale were filled by university teachers (N = 455) from Universities in Northern Nigeria.

Result Pertaining to the Influence of Pedagogical Knowledge on the Behavioural Intention of University Lecturers to Use Blended Learning in Higher Education

To analyse the relationship between pedagogical knowledge and behavioural intention of university lecturers to use blended learning in higher education, scales pertaining to technology acceptance and behavioural intention to use blended learning were administered and data were generated, the r-value was calculated using the Pearson Product Moment Correlation Method. The results are shown below in table 2.1

H_a: Pedagogical knowledge has a significant influence on the behavioural intention of northern Nigerian university lecturers to use blended learning in higher education.

TABLE-2.1

Relationship Between Pedagogical Knowledge (PK) and Behavioural Intentions To Use Blended Learning (BIUBL) in Higher Education among University Lecturers

Variables	N	df	r-value	Remark
pedagogical knowledge	455	453	.649**	P = .000 < .01
Behavioural intentions to use blended learning				

Critical values of r ($df=453$) at 0.05 and 0.01 level of confidence are 0.088 and 0.115 respectively.

INTERPRETATION

Data presented in Table 2.1 above indicate that the value of Pearson Product Moment Correlation Coefficient between pedagogical knowledge and behavioural intention is .649. This value of correlation (.469) is positive and statistically significant at both levels of confidence. Thus, the stated hypothesis that pedagogical knowledge has a significant influence on the behavioural intentions of university lecturers to use blended learning in higher education is retained.

Influence of Pedagogical Knowledge (PK) on the Behavioural Intention to Use Blended Learning (BIUBL) in Higher Education among University Lecturers

The linear regression analysis was applied to the collected data to see the influence of pedagogical knowledge on the behavioural intention of university lecturers to use blended learning in higher education. The results are presented below in table 2.2 and 2.3 respectively.

Table-2.2

Model and ANOVA Summary for Pedagogical Knowledge (PK) as Contributor of Behavioural Intention to Use Blended Learning in Higher Education among University Lecturers

The objective was to analyse the influence of pedagogical knowledge on the behavioural intention of university lecturers to use blended learning in higher education. Regression has been computed and results are presented below in tables 2.2 and 2.3 respectively.

H_a: Pedagogical knowledge has a significant influence on the behavioural intention of northern Nigerian university lecturers to use blended learning in higher education.

Table-2.2-Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.649	.421	.420	3.29

Table-2.3 –ANOVA Summary

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1843.97	1	3569.721	329.362	0.000
Residual	6635.49	453	10.838		
Total	8479.46	454			

Interpretation

It is clear from the regression tables 2.2 and 2.3 that pedagogical knowledge yielded a coefficient regression (R) of .649 and an R square for the same found to be .421. This indicates that a 42.1% variation in behavioural intention to use blended learning in higher education among university lecturers is explained by pedagogical knowledge in the model. The variation of 42.1% is significant at (0.01) level of significance. So, it is evident from Table 2.2 (R square = .421) that only 42.1% of the behavioural intention to use blended learning in higher education has been explained by pedagogical knowledge in the case of university lecturers. Therefore, a 42.1% variation in the behavioural intention to use blended learning in higher education is explained by the independent variable (pedagogical knowledge), and a 57.9% variation in the behavioural intention to use blended learning in higher education is explained by other variables.

Table 2.4 Coefficients of Regression

Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	12.439	1.123	-	11.081	0.00
Pedagogical Knowledge	.706	.039	.649	18.148	0.00

Interpretation

From Table 2.4 of coefficients of regression above, the regression equation is behavioural **intention to use blended learning in higher education** = 12.439 +.706 (pedagogical knowledge).

So, with a unit increase in pedagogical knowledge, there will be .706 times increase in the behavioural intention of university lecturers to use blended learning in higher education.

Hence the stated hypothesis, that pedagogical knowledge has a significant influence on the behavioural intention of university lecturers to use blended learning in higher education, is accepted.

3.1 Impact of Content Knowledge (CK) on the Behavioural Intention of University Lecturers to Use Blended Learning in Higher Education

The technology acceptance scale and behavioural intention to use blended learning scale were filled by university teachers (N = 455) from Universities in Northern Nigeria.

Result Pertaining to the Influence of Content Knowledge on the Behavioural Intention of University lecturers to Use Blended Learning in Higher Education

To analyse the relationship between Content Knowledge and behavioural intention of university lecturers to use blended learning in higher education, scales pertaining to technology acceptance and behavioural intention to use blended learning were administered and data were generated, the r-value was calculated using the Pearson Product Moment Correlation Method. The results are shown below in Table 3.1.

H_a: Content knowledge has a significant influence on the behavioural intention of northern Nigerian university lecturers to use blended learning in higher education.

TABLE-3.1

Relationship Between Content Knowledge (CK) and Behavioural Intention To Use Blended Learning (BIUBL) in Higher Education among University Lecturers

Variables	N	df	r-value	Remark
Content Knowledge	455	453	.587**	P = .000 < .01
Behavioural intentions to use blended learning				

Critical values of r ($df=453$) at 0.05 and 0.01 level of confidence are 0.088 and 0.115 respectively.

INTERPRETATION

Data presented in Table 3.1 above indicate that the value of Pearson Product Moment Correlation Coefficient between content knowledge and behavioural intention is .587. This value of correlation (.587) is positive and statistically significant at both levels of confidence. Thus, the stated hypothesis that; content knowledge has a significant influence on the behavioural intentions of university lecturers to use blended learning in higher education is retained.

Influence of Content Knowledge on the Behavioural Intention of University Lecturers to Use Blended Learning in Higher Education

Linear regression analysis was applied to the collected data to see the influence of content knowledge on the behavioural intention of university lecturers to use blended learning in higher education. The results are presented below in Tables 3.2 and 3.3 respectively.

Table-3.2

Model and ANOVA Summary for Content Knowledge as Contributor of Behavioural Intention of University Lecturers to Use Blended Learning in Higher Education

The objective was to analyse the influence of content knowledge on the behavioural intention of university lecturers to use blended learning in higher education. Regression has been computed and results are presented below in tables 3.2 and 3.3 respectively.

H_a: Content knowledge has a significant influence on the behavioural intention of northern Nigerian university lecturers to use blended learning in higher education.

Table 3.2-Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.649	.345	.343	3.50

Table 3.3 –ANOVA Summary

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1843.97	1	2924.243	238.457	0.000
Residual	6635.49	453	12.263		
Total	8479.46	454			

Interpretation

It is clear from the regression tables 3.2 and 3.3 that content knowledge yielded a coefficient regression (R) of .587 and an R square for the same found to be .345. This indicates that a 34.5% variation in behavioural intention to use blended learning in higher education among university lecturers is explained by content knowledge in the model. The variation of 34.5% is significant at (0.01) level of significance. So, it is evident from Table 3.2 (R square = .345) that only 34.5% of the behavioural intention to use blended learning in higher education has been explained by content knowledge in the case of university lecturers. Therefore, a 34.5% variation in the behavioural intention to use blended learning in higher education is explained by the independent variable (Content Knowledge), and a 65.5% variation in the behavioural intention to use blended learning in higher education is explained by other variables.

Table 3.4 Coefficients of Regression

Model	Unstandardised	Standardised	t	Sig.
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	Coefficients		Coefficients		
	B	Std. Error	Beta		
Constant	16.013	1.088	-	14.721	0.00
Content Knowledge	1.346	.087	.587	15.442	0.00

Interpretation

From Table 3.4 of coefficients of regression above, the regression equation is behavioural **intention to use blended learning in higher education** = 16.013 +1.346 (Content Knowledge).

So, with a unit increase in Content Knowledge, there will be a 1.346 times increase in the behavioural intention of university lecturers to use blended learning in higher education.

Hence the stated hypothesis that content knowledge has a significant influence on the behavioural intention of university lecturers to use blended learning in higher education, is accepted.

Result Pertaining to the Influence of TPaCK on the Behavioural Intention of University Lecturers to Use Blended Learning in Higher Education

To analyse the relationship between TPaCK and behavioural intention of university lecturers to use blended learning in higher education, scales pertaining to technology acceptance and behavioural intention to use blended learning were administered and data were generated, the r-value was calculated using the Pearson Product Moment Correlation Method. The results are shown in Table 4.1 below;

H_a: TPaCK has a significant influence on the behavioural intention of northern Nigerian university lecturers to use blended learning in higher education.

TABLE 4.1

Relationship Between TPaCK and Behavioural Intentions To Use Blended Learning (BIUBL) in Higher Education among University Lecturers

Variables	N	df	r-value	Remark
TPaCK	455	453	.674**	P = .000 < .01
Behavioural intentions to use blended learning				

Critical values of r (df=453) at 0.05 and 0.01 level of confidence are 0.088 and 0.115 respectively.

INTERPRETATION

Data presented in Table 4.1 above indicate that the value of Pearson Product Moment Correlation Coefficient between TPaCK and behavioural intention is .674. This value of correlation (.674) is positive and statistically significant at both levels of confidence. Thus, the stated hypothesis that TPaCK has a significant influence on the behavioural intentions of university lecturers to use blended learning in higher education is retained.

Influence of TPaCK on the Behavioural Intention of University Lecturers to Use Blended Learning in Higher Education

The linear regression analysis was applied to the generated data to see the influence of TPaCK on the behavioural intention of university lecturers to use blended learning in higher education. The details are presented below in Tables 4.2 and 4.3;

Table 4.2

Model and ANOVA Summary for TPaCK as Contributor of Behavioural Intention of University Lecturers to Use Blended Learning in Higher Education

The objective was to analyze the combined influence of TPaCK and UTAUT-3 on the behavioural intention of university lecturers to use blended learning in higher education. Regression has been computed and results have been presented firstly for TPaCK in tables 4.12.2 and 4.12.3 respectively.

H_a: TPaCK has a significant influence on the behavioural intention of university lecturers to use blended learning in higher education.

Table 4.2-Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.674	.454	.453	3.19

Table 4.3 –ANOVA Summary

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1843.97	1	3847.992	376.369	0.000
Residual	6635.49	453	10.224		
Total	8479.46	454			

Interpretation

It is clear from the regression tables 4.2 and 4.3 above that TPaCK yielded coefficient regression (R) of .674 and R square for the same was found to be .454. This indicates that a 45.4% variation in behavioural intention to use blended learning in higher education among university lecturers is

explained by TPaCK in the model. The variation of 45.4% is significant at (0.01) level of significance. So, it is evident from Table 4.2 above ($R^2 = .454$) that only 45.4% of the behavioural intention to use blended learning in higher education has been explained by TPaCK in the case of university lecturers. Therefore, a 45.4% variation in the behavioural intention to use blended learning in higher education is explained by the independent variable (TPaCK), and a 54.6% variation in the behavioural intention to use blended learning in higher education is explained by other variables.

Table 4.4 Coefficients of Regression

Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	10.595	1.145	-	9.253	0.00
TPaCK	.287	.015	.674	19.400	0.00

Interpretation

From Table 4.4 of coefficients of regression, the regression equation is behavioural **intention to use blended learning in higher education** = **10.595 +.674 (TPaCK)**.

So, with a unit increase in TPaCK, there will be a .674 times increase in behavioural intention to use blended learning by university lecturers in higher education.

Hence the stated hypothesis, that TPaCK has no significant influence on behavioural intention to use blended learning in higher education, is rejected.

Discussion and Conclusion

The results of this study show that Northern Nigerian university lecturers' behavioural intention to use blended learning is highly influenced by the Technological Pedagogical Content Knowledge (TPaCK) individual components. More specifically, there was a positive correlation between behavioural intention and technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK). Additionally demonstrating a compounding effect, the combined model (TPaCK) highlights the significance of an integrated approach to technology, pedagogy, and content in influencing lecturers' intents. These findings imply that lecturers are more likely to adopt and use blended learning methodologies if they have higher levels of TPaCK.

The findings are also consistent with earlier research emphasising the crucial influence of TPaCK on teachers' adoption and usage of technology. For example, a study conducted in 2016 by Qaseem and Viswanathappa showed that teachers' technology integration skills improved dramatically when their TPaCK was enhanced through blended learning methodologies. Comparably, the results corroborate those of research by Anthony Jr., Kamaludin, and Romli (2023), which offers insights into how higher

education can support lecturers' use of BL to increase the effectiveness of their instruction by giving educators a better understanding of their perspectives on course content, pedagogy, and the use of technology to improve teaching in various contexts, including Nigeria.

Similarly, Khong, Celik, Le, Lai, Nguyen, & Bui (2023) found that teachers' behavioural intention to teach online after the pandemic was influenced by the combined effects of TPaCK, perceived usefulness (PU) of technology, and innovativeness. TPaCK was found to be a significant predictor of behavioural intention to use educational technologies in all of these trials. The results are consistent with research by Chaipidech, Srisawasdi, Kajornmanee, & Chaipah (2022), which showed that teacher preparation in digital teaching abilities, such as TPaCK, is essential for the successful implementation of blended learning.

In what is considered opposite to these findings, pre-service teachers believe they are adept at incorporating technology into their lessons despite lacking pedagogical skills, according to research by Luik, Taimalu, and Suviste (2018).

This study investigated the relationship between university lecturers' behavioural intention in Northern Nigeria to employ blended learning and their knowledge of technological pedagogical content knowledge (TPaCK). The results showed that instructors' intentions to use blended learning are highly influenced by each of the three TPaCK components: technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK). Higher TPaCK lecturers are more likely to use blended learning strategies.

It is recommended that university lecturers undergo thorough training sessions that concentrate on enhancing their TPaCK in light of the study's findings. University curricula should incorporate TPaCK development modules to ensure that instructors have the skills necessary to use blended learning effectively. These programmes should also offer ongoing support, such as access to digital tools, technical assistance, and opportunities for continuous professional development, to help instructors build and maintain their TPaCK competencies. Educational policymakers should acknowledge the importance of TPaCK and create policies that encourage its integration into teacher education programmes. Funding for TPaCK related projects can also encourage widespread adoption.

A deeper understanding of how TPaCK development affects technology uptake over time will be possible with this method. The study's conclusions will be more broadly applicable if lecturers from other geographical areas and educational settings are included. Studies that compare various institutional and cultural contexts can reveal particular TPaCK integration issues and solutions.

Implications for the Study

The substantial influence of TPaCK on behavioural intention has the following useful ramifications:

Professional Development: TPaCK development, with an emphasis on the fusion of technology and pedagogy with content, ought to be emphasised in lecturer training programmes.

Curriculum Design: To educate lecturers on the successful deployment of blended learning, the university curriculum should include modules on TPaCK.

Support Systems: To assist instructors in continuously enhancing their TPaCK competencies, institutions should offer continuing support and resources.

Formulating Policies: Legislators in charge of education should acknowledge the value of TPaCK and provide funding for programmes that encourage university lecturers to use it.

Limitations of the Study

This study looks at the TPaCK levels and behavioural intention of university lecturers in Northern Nigeria with an emphasis on blended learning. It entails a survey conducted among lecturers from nine (9) randomly chosen local universities. Lecturers from other parts of Nigeria or higher education levels, including polytechnics, colleges of education, or primary or secondary schools, were not included in the study. The study is subject to many limitations, such as possible biases in self-reported data and variations in the accessibility of technology resources among various institutions. Technology Infrastructure: The TPaCK and behavioural intention of lecturers may be impacted by differences in technological infrastructure between universities that were not taken into account.

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