



KARATINA UNIVERSITY
The Green Entrepreneurial University

**INTEGRATION OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
IN MANAGING TECHNICAL TRAINING INSTITUTIONS
IN NAIROBI AND NYERI COUNTIES, KENYA**

By

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PRESENTATION HIGHLIGHTS

1. Introduction and background to the study
2. The research problem
3. The study objectives and Hypothesis
4. Significance and Scope of the study
5. Theoretical Framework & Conceptual framework
6. Summary of Literature review & research gaps
7. Research methodology
8. Research findings ,conclusion and recommendations



INTRODUCTION/BACKGROUND OF THE STUDY

- Information and Communications Technology (ICT) -key driver of worldwide digitalized 21st century economy, which relies on relevant skills, OECD(2015)
- ILO(2015),world grappling with youth unemployment due to lack of relevant skills not shortage of jobs in economy
- Sustainable development goals(SDG) 4.3 and 4.4 to increase number of youths and adults with relevant skills for employment, decent work and entrepreneurship(UNESCO,2015),NESSP (2018-2022) ICT in achievement SDG4
- ICT is seen to have the potential to create transformative changes in skills development through TVETs (Saina, Mukwa & Kyalo, 2018).,Qingdao declaration (Tok &Sora 2013)
- Education 2030 Framework for action,(UNESCO, 2015), Shanghai consensus on ICT (2012) puts ICT as essential tool for strengthening TVETs systems and enhancing quality and effective learning



- TVETs are the solution to provision of world skills requirements.
- ICT(driver of world economy) crucial to TVET as it aids; interactive, collaborative, stimulating, motivating, flexible and variety learning.
- Globally; European Union ;ICT is the instrument to revitalize and position TVETs to prepare young people for work in digitalized economy (Pradhan, Arvin, Nair & Bennett, 2020).
- Also to ensure Europe remains competitive and innovative in the face of increasing global competition and shifting demographics (Picatoste, Pérez-Ortiz & Ruesga-Benito, 2018).
- Australia ;TVET critical in accelerating economic development (Kanwar, Balasubramanian & Carr, 2019).
- In Africa, ICT integration in TVETs at dynamic phase (Naidoo & Dawuwa, 2019) and (ADB,2012)
- Egypt, Mauritania, Morocco and Sudan had articulated digitalization of TVETs in their ICT policies (Lolwana, 2017).



- Negative profiling of TVET in Kenya, (Obwoye & Kibor, 2016)
- Recent surge in TVETs enrolment-**148000** in 2012 to **451000** in 2020 (Economic Survey, 2021)
- Digital equipment supplied to 43 (forty three) TTIs, as of 2020,
- More than 3872 Master teacher trainers trained on ICT, 3653 teachers trained on ICT integration (TVET Authority Kenya Report, 2020).
- It is now possible to utilize ICTs in TVET in various levels of training, UNESCO (2016),
- UNESCO Institute for Statistics (2015) reports mismatch between integration of ICT in institutional management and pedagogy in Africa
- Europe; with best educational facilities, but lags behind in the integration of ICT in TVETs as compared to China, Taiwan and India. Papadakis (2016)



- GoK recognizes ICT workforce as foundation for transition to Knowledge economy (Saina et al 2018)
- Educationists are emphasizing impartation of 21st century skills ,through ICT(Sarkar, 2012).
- ICT is dominant and crucial in educational policies –since MDGs and EFA ,Kenya vision 2030 & SDGs (UN 2015)
- TVETs among pivotal agents for addressing digital divide challenges (National ICT policy, Ministry of Education ,2012)
- Education institutions can no longer properly prepare students to function competently in the global economy without adequately integrating ICT in the curriculum (Hutchison & Reinking,2011)



The Research Problem

- In Kenya, level of ICT integration in the management of TVETs unknown ,not clearly documented
- Scholarly attempts to assess ICT integration has largely focused on secondary education.
- Massive support for ICT in TVETs in the recent past has not been resonated on research front.
- Paucity of research on ICT integration in TVETs in Kenya despite various TVET policy documents since 2013;TVETA Master plan 2016-2031,TVET Standards2020,TVET Reform strategy 2016-2020
- Studies on ICT integration by; Abuya (2014), Agufana, Too and Mukwa (2018), Maina, Ogola and Mwai (2016) had research gaps that the present study identified and sought to address by assessing integration of ICTs in TTIs in the wake of digitalization and expansion particularly in the management of TTIs in Nyeri and Nairobi counties in Kenya.



Research Objectives & Hypothesis

General Objective ; To assess the level of integration of ICT between TTIs in Nairobi and Nyeri Counties in Kenya. **Specifically ;**-To evaluate the level of integration of ICT in; (a) Performing administrative functions. (b) financial management. (c) instructional processes and (d) assessment practices in Technical Training Institutions in Nyeri and Nairobi Counties in Kenya.

Hypothesis

➤ **HO₁** There is no Statistically significant difference in the level of integration of ICT in administrative tasks; **HO₂** There is no Statistically significant difference in the level of integration of ICT in financial ; **HO₃** There is no Statistically significant difference in the level of integration of ICT in instructional processes; **HO₄** There is no Statistically significant difference in the level of integration of ICT in assessment practices between Technical Training Institutions in Nyeri and Nairobi Counties in Kenya.



Significance of the Study

TVET educational policymakers, BOMs, Ministry of Education & donors, Institutional Administrators, KEMI, Rationale for ICT investment, Rate integration levels, communication transformation, Basis for integration, Validation of other studies.

Scope of Study

Study conducted in public TTIs in Nyeri and Nairobi counties. Involved all the Principals, Bursars and Trainers in the TTIs. The study examined ICT integration in administrative tasks, financial management, Instructional processes and Assessment practices within the TTIs.



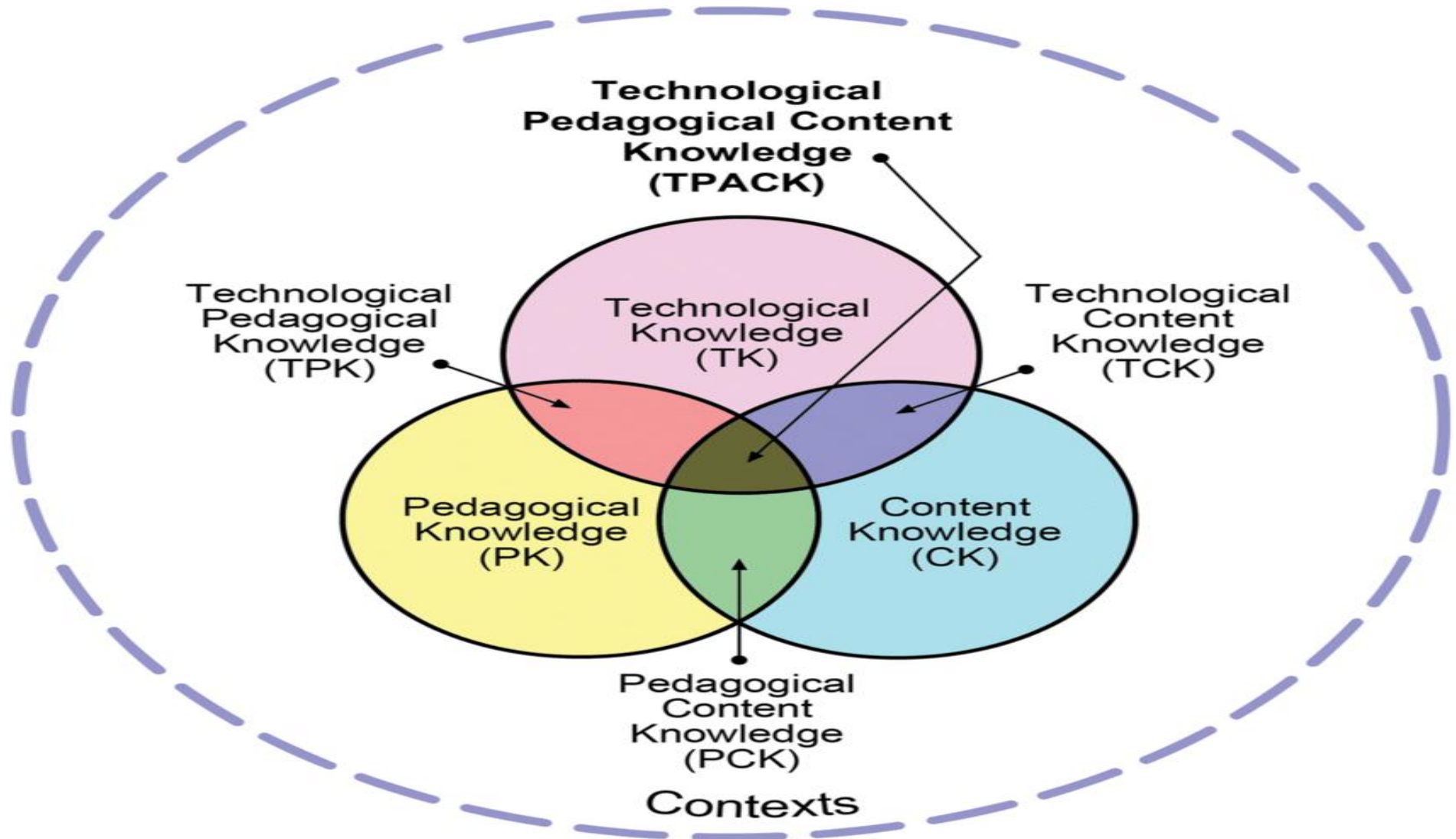
Theoretical Framework

- Two theories applied
- **Adaptive Structuration Theory - advanced by DeSanctis and Poole (1994)**
- DeSanctis and Poole advanced Giddens' theory of structuration to study the interaction of groups and organizations with information technology (Barrett, 2018).
- It states that groups and organizations using ICT for their work dynamically create perceptions about the role and utility of the technology, and how it can be applied to their activities (Aktaruzzaman & Plunkett, 2016).
- These perceptions can vary widely across groups and may influence the way technology is used and hence mediate its impact on group outcome.
- Theory useful in examining the status and integration of ICT in the management of TVET institution.

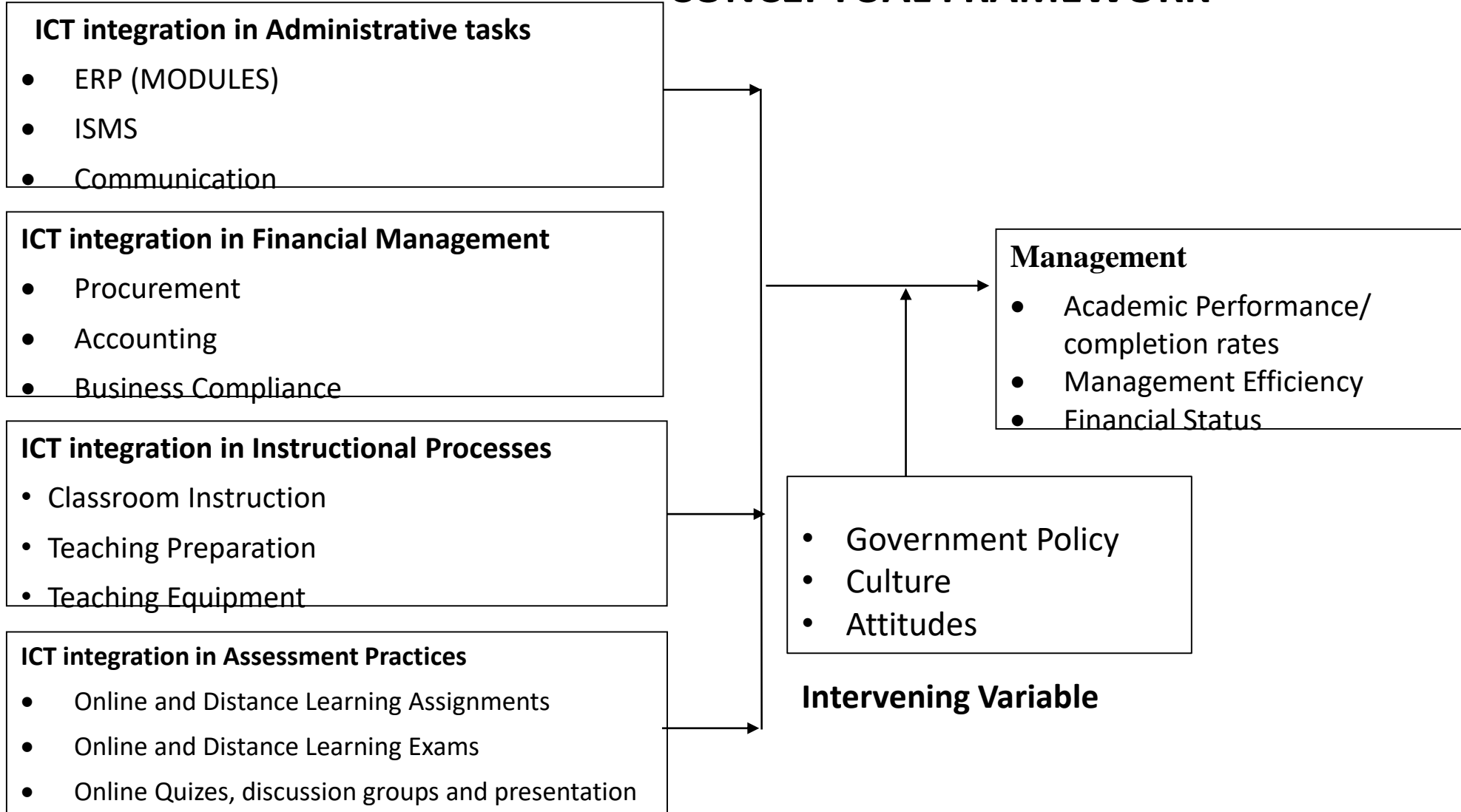


- **Technical Pedagogical Content Knowledge (TPACK) model** – introduced by Koehle and Mishra (2006)
- TPACK is built on Shulman's (1986) study of Pedagogy and Content Knowledge.
- The addition of technological knowledge by Koehler and Mishra (2006) was included to explain effective teaching with the use of technology.
- According to Baran, Chuang and Thompson (2011), TPACK framework has emerged as a clear and useful framework for researchers working to understand technology integration in teaching and learning,
- hence relevant and was applied in this study.

The components of the TPACK framework Source (<http://tpack.org>)



CONCEPTUAL FRAMEWORK





Summary Literature Review

The empirical review consisted of about 51 studies which consisted of various research gaps that the current study sought to fill. Some of these studies include;

- Koech (2016), Mosebo and Makhetha-Kopane (2018), Ngowi (2017), Oyier et.al.(2015) and Lupiana and Mkumbwa (2019) consisted of **contextual gaps**.
- Chen and de Araujo (2017), Mue (2014), Kombo (2015), Muema (2015) and Kamau (2017) had methodological and **theoretical gaps**.
- Muthaa (2019), Blau and Shamir-Inbal (2017), Kariuki, Muiruri and Sang (2017), Mwaniki and Njoroge (2018) and Masenge (2019) had **conceptual gaps**.



RESEARCH METHODOLOGY

Research Philosophy	Positivism Research philosophy (Cazeaux,2017)
Research Design	Descriptive Survey research design(Akhtar,2016),(Sileyew,2019.)
Location of the study	TVET Institutions in Nyeri and Nairobi Counties Kenya
Target Population	The target population comprised of 10 principals, 1006 lecturers and 10 bursars total 1026
Sample Size and Sampling Techniques	Sample size -310 respondents (10 Principals, 10 Bursars and 290 Lecturers Purposive stratified random sampling techniques for Principals and Bursars. Sampling table by Krejcie and Morgan (1970) used to get 290 lecturers



Data Collection Instruments

Questionnaires for Lecturers. Applied Interview guide to Bursars and Principals'

Data Analysis & Presentations

Qualitative data analyzed using thematic analysis.

The MS Excel was used in compiling, editing, categorizing and coding of the quantitative data collected through questionnaires

The SPSS v24.1 was used to generate descriptive statistics, t-test analysis results.



RELIABILITY & VALIDITY OF THE RESEARCH INSTRUMENTS

- Reliability –consistency of measurement (Morin,2013.)
- Piloted in Kangema TTI and Thika TTI,
- 29 Trainers involved.10% of Sample .Supported by Neff & Germer,(2013)
- Reliability was tested using Cronbach alpha coefficient.
- The questionnaire's reliability was calculated and yielded a Cronbach's alpha (α) of 0.903 in the measurement of ICT integration
- Content validity was established through expert opinion by the supervisors and further ascertained through factor analysis.



Ethical Considerations

- Ethical protocols
- Introduction/authorization from the SESS/
- NACOSTI certification, before commencement of data collection
- Authorization from County Director of TVET, Principal of TTI ,
- assurance of voluntary participation to respondents and confidential handling of data ,meant for this research only,no harassment ,no inducements ,withdrawal without notice allowed,,,,,



DATA ANALYSIS AND PRESENTATION

Questionnaires Response Rate

Response Rate	Sample	Frequency (Returned)	Unreturned
Returned Questionnaires	290	242 (83.45%)	48 (16.55%)
Bursars interview guide	10	10 (100%)	0 (0%)
Principals interview guide	10	10 (100%)	0 (0%)
Total	310	262 (84.52%)	48 (15.48%)

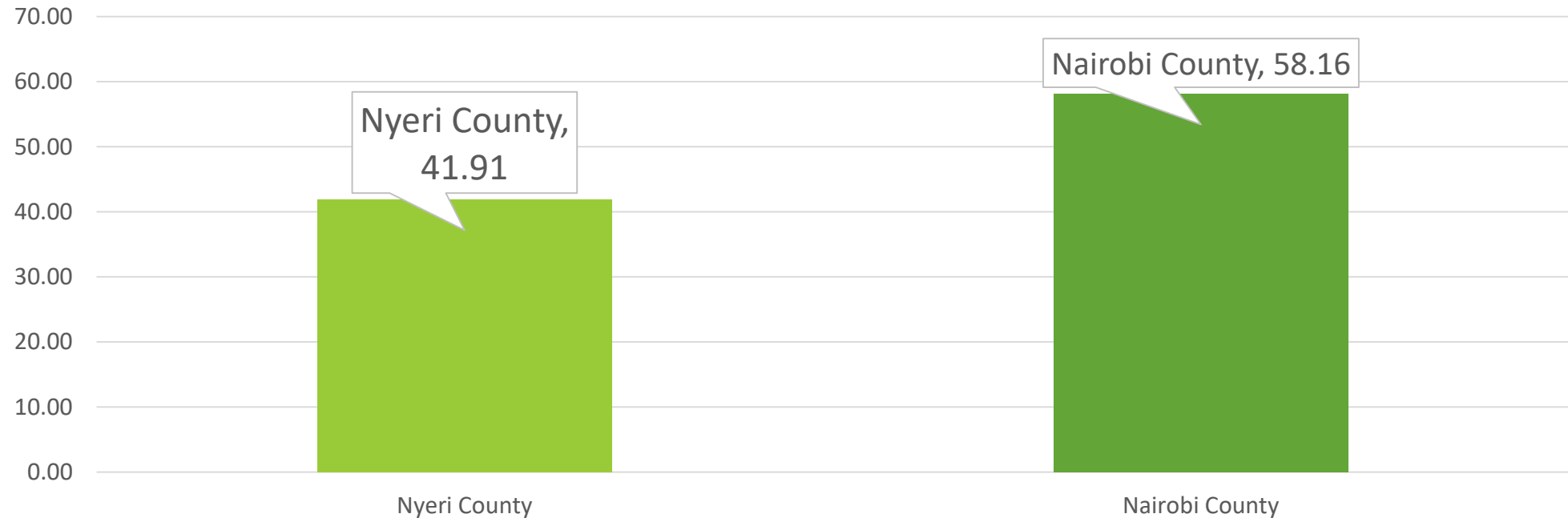
Rowley (2014), response rate above 70% sufficient for further data analysis.

response rate of **84.52%** was found sufficient for data analysis in this study.



Objective 1

Level of ICT Integration in Administrative Tasks




The aggregate results with respect to the ICT integration in carrying out administrative tasks indicated that Nyeri had 41.91% while Nairobi was at 58.16% .

T-test Analysis for ICT Integration in Administrative Functions

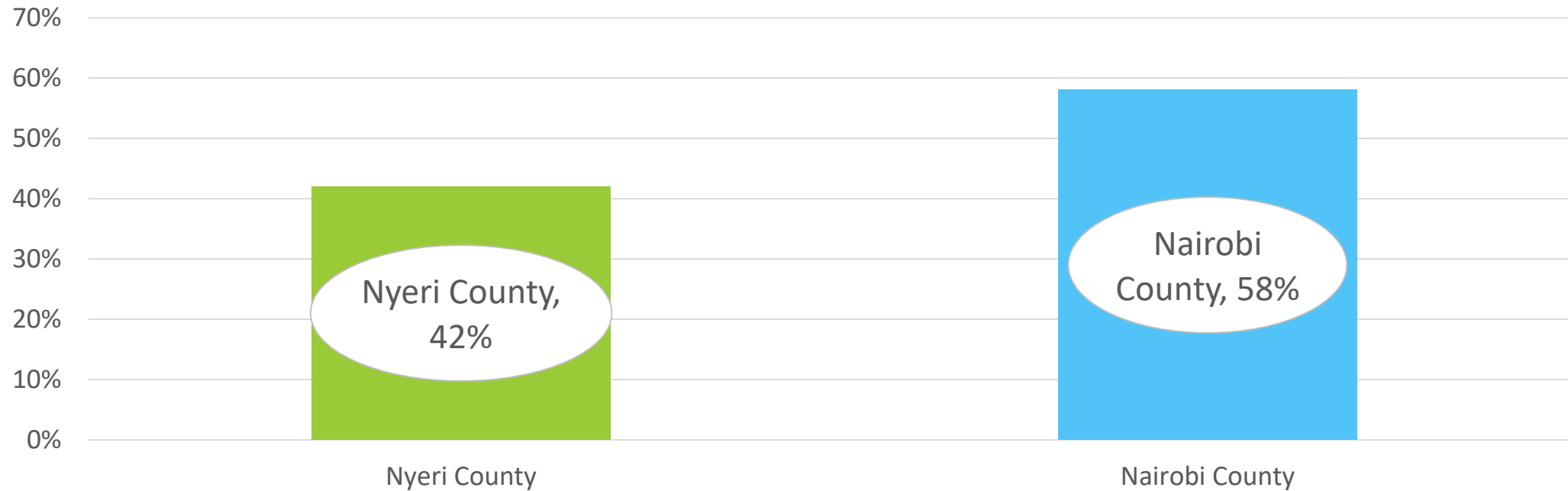
Variables	Counties	Percent %	Mean	T-statistic	P-value
Administrative functions	Nyeri	41.91	2.464158		
	Nairobi	58.16	3.419753		
	Total	100	5.88	0.076753	0.0000

ICT Integration in Administrative Functions

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- Keys areas  ERP, ISMS systems ,business telephone systems. staff training,(most TTIs)
 - Investing in communication system meant to enhance communication ,accessibility and general efficiency
 - Disparity observed ---may be due to prevalence of internet connectivity in rural areas vs urban areas
 - that TTIs in Nairobi County are more aware and exposed to new developments in ICT integration than TTIs in Nyeri county.
 - Ogony (2017) study on factors influencing implementation of quality management systems in TVETs in Nairobi country



Objective 2; ICT Integration in Financial Management



The aggregate results in regard to the level of ICT integration in financial management indicated that TTIs in Nyeri County had 42% while TTIs in Nairobi County had 58%.

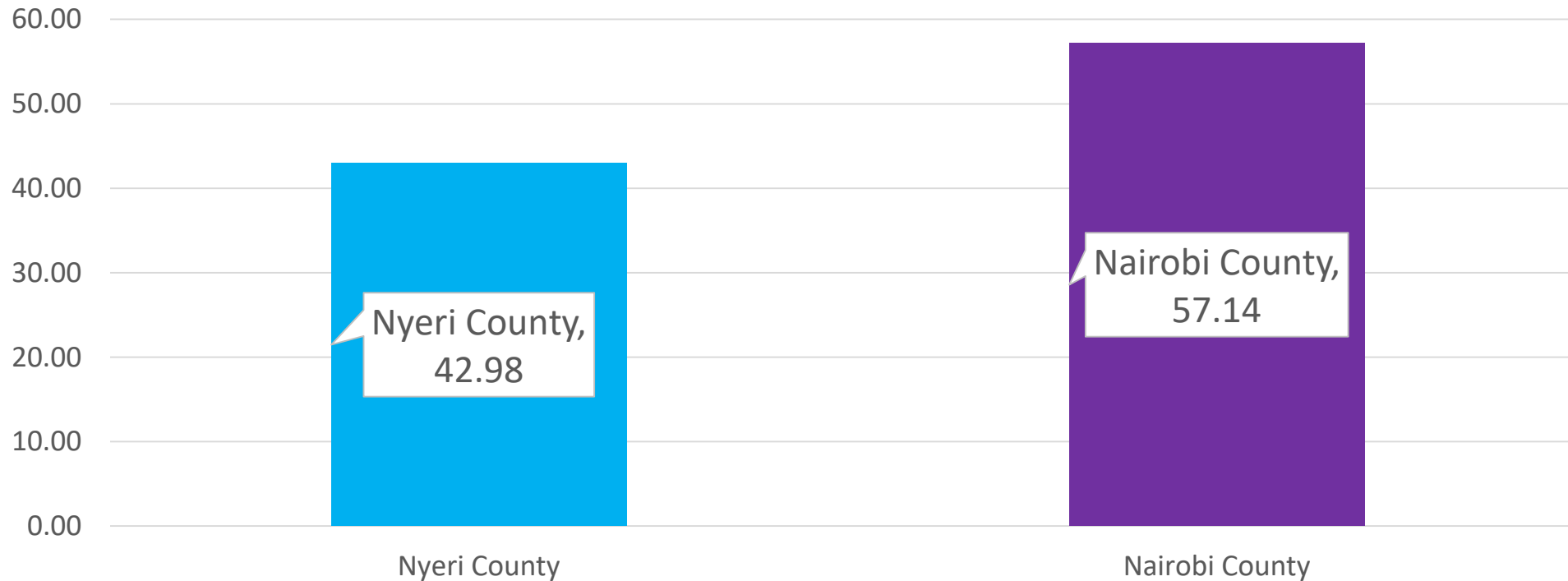
T-test Analysis for ICT Integration in Financial Management

Variables	Counties	Percent %	Mean	T-statistic	P-value
Financial management	Nyeri	42%	2.52957		0.000
	Nairobi	58%	3.492798		
	Total	100%	6.02	0.072172	

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- Key areas;-e-procurement systems, automated budgeting systems and accounting information systems (AIS)in training staff.
 - TTIs aiming at efficient and transparent processes, GoK requirement for e-procurement system
 - The level of ICT integration in Nairobi County exceeded that of Nyeri County,
 - likely due to TTIs in Nairobi County having more robust ICT platforms that facilitate effective financial reporting systems, ensuring accountability and transparency throughout the accounting cycle, (Njenga, 2013).



Objective 3 ;ICT Integration in Instructional Processes



The aggregate results in regard to the level of ICT integration in instructional processes revealed that TTIs in Nyeri County had 42.98% while TTIs in Nairobi County had 57.14%.

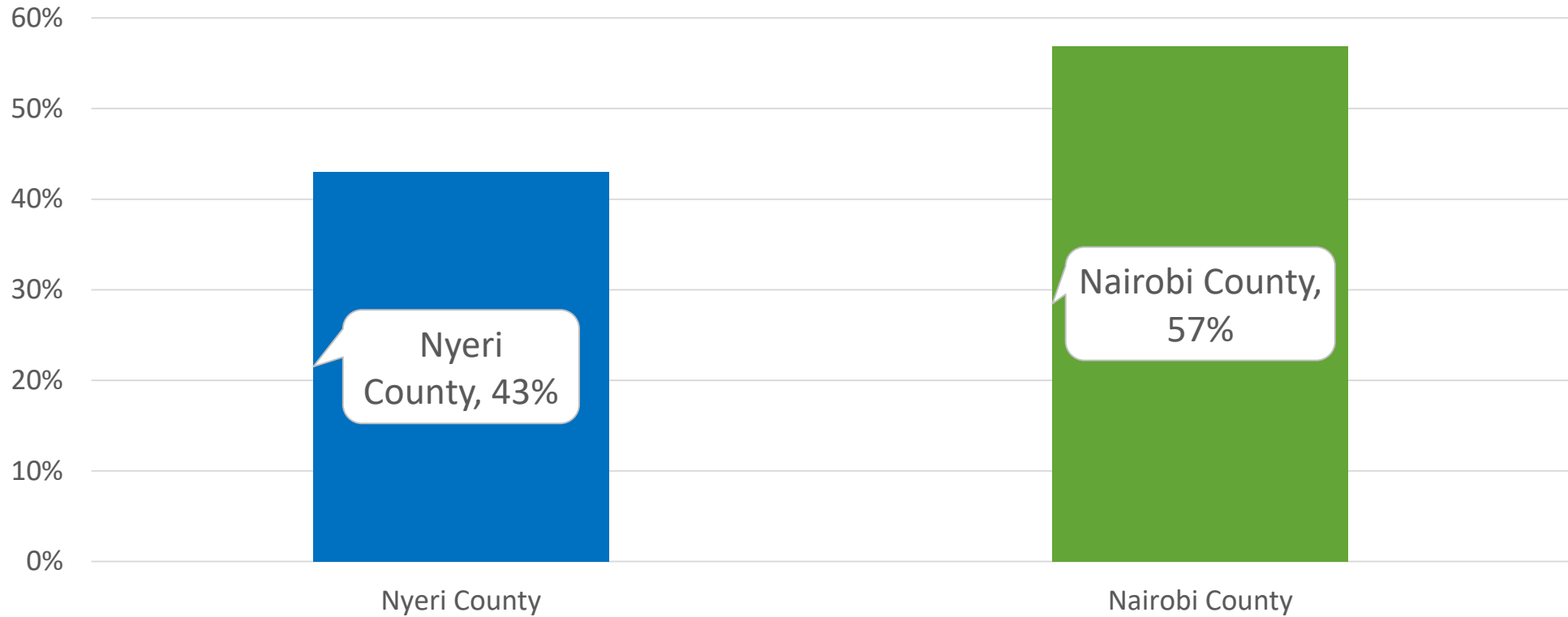
T-test Analysis for ICT Integration in Instructional Processes

Variables	Counties	Percent %	Mean	T-statistic	P-value
Av_instructional processes	Nyeri	42.98	2.552867		
	Nairobi	57.14	3.394033		
	Total	100%	5.94	0.073049	0.000

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- Key areas; e-learning systems, software and equipment for course content preparation by trainers, online presentation software such as Google Meet and Zoom and an e-library. training.
 - Was about commitment for continuous improvement, tools of work are fundamental to successful learning,,,,Supported online video conferencing .
 - Difference likely due to TTIs in Nairobi County having better access to ICT facilities-digital divide
 - Facilitation in training for the efficient integration of new tools and methodologies into the curriculum and instructional practices.-efficiency in use of equipment by trainers


Objective 4; ICT Integration in Assessment Practices



The aggregate results with respect to the level of ICT integration in assessment practices revealed that TTIs in Nyeri County had 43% while TTIs in Nairobi County had 57%.

T-test Analysis for ICT Integration in Instructional Processes

Variables	Counties	Percent %	Mean	T-statistic	P-value
Av_instructional processes	Nyeri	42.98	2.552867		
	Nairobi	57.14	3.394033		
	Total		5.94	0.073049	0.0000

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- Key areas  exam processing, modules for online examinations, capacity for online assignments, for online discussions, invest in training staff
 - Delivery of high quality educational assessment
 - This disparity;- access to ICT infrastructure in TTIs located in Nairobi County, enabling more meaningful ICT integration in assessment practices compared to TTIs in Nyeri County.
 - trainers in Nyeri County lacking the necessary capacity to embrace ICT for pedagogical integration and assessment practices.
 - Yu et al(2023) –urban TVET teachers better equipped in integration



Conclusion

- The study concluded that the level of ICT integration in administrative tasks was higher for TTIs in Nairobi County than in Nyeri Counties.
- The study concluded that the level of ICT integration in financial management for TTIs in Nairobi County was more than that of Nyeri County.
- The study concluded that there was a higher level of ICT integration in instructional processes for TTIs in Nairobi county than in Nyeri county.
- The study concluded that there was a higher level of ICT integration in assessment practices for TTIs in Nairobi county than in Nyeri county.



Recommendations -Policy

- There is need for the government to strengthen the ICT policy in order to **enhance resource allocation** by the ministry and respective institutions required to deepen integration of ICT in Kenya.
- There is need for government to make **it compulsory through the ICT policy for all institutions to integrate ICT in all their operations** in order to promote effectiveness and efficiency in governance ,teaching and learning process.
- Through the ICT policy, the government should have an **annual performance target** for every institution to file reports about their levels of ICT integration in all operations within the institution.



Recommendations ;Practice/Management

- There is need for TTIs in Nyeri to play catch up to those of Nairobi by investing more on ICT Integration
- There is need for TTIs in Nairobi to invest more to improve on their ICT Integration since they are yet to obtain a 100% integration. The TVETs in Nairobi may be doing better than TVETs in Nyeri, but they need to invest more since most integration rates are about 60%.



Recommendations -Theory

- This study results are a valuable addition to literature regarding ICT integration in TVETs. Scholars of ICT , online education models, pedagogy may use the study as a baseline study for determining what future studies to undertake on this area.
- For instance, future studies could focus on the cost benefit analysis or effect or value for money of investing in ICT integration. Such studies would seek to determine whether ICT integration leads to better school management outcomes and to better academic performance as well as employability skills.
- The study also validates the theories and strengthens the use of Technical Pedagogical Content Knowledge (TPACK) model and Adaptive Structuration Theory in future studies that are oriented to ICT Integration in Education.



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The End

Thank you

May Almighty God Bless You

