

THE ROLE OF TECHNOLOGY AND INNOVATIVE TEACHING METHOD IN IMPROVING PRIMARY EDUCATION OUTCOMES IN OTUKPO LGA, BENUE STATE OF NIGERIA

By

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Abstract

The Study Examined The Role Of Technology And Innovative Teaching Methods In Improving Primary Education Outcomes In Otukpo Lga, Benue State. The Study Adopted A Descriptive Survey Research Design. The Population For The Study Was 845, Out Of Which A Sample Of 85 Was Obtained Using Multistage Sampling Involving Purposive, And Simple Random Sampling. The Instrument Titled: Role Of Technology And Innovative Teaching Method Questionnaire (rtitm) Was Used To Collect Data. The Instrument Underwent Validation By Three Experts And Demonstrated Reliability Of 0.81 Through The Test-retest Technique. Research Assistant Was Used To Administer The Instruments, And The Data Obtained Was Analyzed Using Mean And Standard Deviation To Answer Research Questions And Chi-square And T-test To Test Hypothesis At 0.05 Level Of Significance. Findings Of This Study Reveal That, The Use Of Technology And Innovative Teaching Method Has Significant Influence On Primary Education Outcomes

Keywords: Technologies, Innovative Teaching Methods, Learning Outcomes, Primary Education

Introduction

Today Is The Era Of Science And Technology With A Great Need To Improve The Quality Of Education Specially Science Education. This Could Only Be Possible By Introducing Fundamental Changes Through Innovative Teaching Methods Through Which Teachers Could Provide A Pupil-centred Learning Environment That Could Make Learning Process Interesting And Understandable To The Young Learners, Especially In Primary Schools. To This End, Tremendous Technology Advancements Have Been Noted In Education In Recent Times. These Innovative Technologies Present New Ways Of Instruction To Improve Upon Traditional Learning Methods. There Are Various Technologies That Have Been Developed And Are In Use In The Modern Times Classroom. These Technological And Innovative Methods Of Teaching And Learning According To Itauma (2022) Include Computer-assisted Instruction (cai), Learning Management Systems, Learning Analytics, Cloud Computing, Mobile Learning, Wearable Technology Such As Google Glass And 3d Printing Among Others.

Although Technology Is Finally Integrated Into The Education System Today, Its Use For Teaching And Learning In Primary Schools In Nigeria Especially, Benue State Still Remains A Challenge. Despite The Fact That Many Primary Schools Today Are Privileged To Have Access To Technology, Trained Teachers, And A Favourable Policy Environment, The Use Of Technology And Innovative Teaching Methods In The Classroom Is Still Low Especially In Otukpo Local Government Area Of Benue State As Observed By The Researcher. Waddell (2015) Attributed The Low Levels Of Technology And Use Of Innovative Teaching Methods To The Pedagogical Beliefs Of Teachers.

Technology Can Therefore Be Seen As Both A Tool And A Catalyst For Change. With The Incorporation Of Technology Into Schools, The Main Purpose Is To Change How Teachers And Pupils Gather, Access, Analyse, Present And Transmit Information. This Can Provide Democratic Information In Classrooms As Well As Help Differentiate Instruction For Different Categories Of Learners. The Use Of Technology Has Enhanced Academic Activities And Made Learning And Knowledge Gain Easy For The Pupils And These Include Devices Such As Mobile Phones, Personal Digital Assistants, Computers, Radios, Televisions, Projectors, Network Communication Devices, Satellite System, Hardware And Software As Well As Other Different Services And Applications (alhan, Balogun&shehu, 2014).

Technology Leads To More Active And Interactive Modes Of Learning Among The Pupils. Teachers Usually Use Technology To Effectively Engage Their Pupils During Learning And To Increase Pupils' Learning Outcomes (kumar, Singh & Kumar, 2022). Various Technologies Have Been Touted As Providing The Ultimate Delivery Mechanism To Achieve These Commendable Goals (kripple, Mckee& Moody, 2010). Technology Helps In Developing A Good Rapport Between The Pupils And Teachers. The Primary Objective Of Technolog, According To Kumar, Singh, & Kumar, (2022) Is Not To Replace The Teachers But To Enhance Its Fundamental Roles.

Studies Have Indicated The Significant Role Of Technology In The Teaching And Learning Process. Isaiah And Wagbara Reported A Significant Influence Of Technology On Students' Learning Outcomes In Social Studies. Obodi, Animercy And Okolo (2022) Conducted A Study In Basic Science And Technology And The Findings Revealed That Students Who Were Taught Using Technological Devices Achieved Higher And Had Higher Interest Than Those Taught Without Technological Device. Bello's (2014) Reported In His Study Of The Impact Of Technology Interventions On Students' Achievement In Rural Nigerian Schools Revealed No Correlation Between Teachers' Level Of Technology Implementation And Student Achievement. Hussain, Suleman, Din And Shafique (2017) Found That Technology Has Positive Effect On Students' Academic Achievement And Retention In The Teaching Of Chemistry. Emeri (2022) Also Reported That Technology Has Significant Impact On Students' Academic Performance. In A Related Finding, Monserate (2018) Found That Effective Application Of Technology Tools In Teaching Enhances Learning Outcome. These Findings Show That Pupils Rely To A Great Extent On Technology.

Studies From Educational Research Supports The Claim That Applying The Role Of Technology In Teaching Results In A Greater Degree Of Learning As Pupils Seem To Concentrate Better And For A More Sustained Period Of Time (ainsworth & Loizou, 2013). Many Pupils Today Have Been Brought Up In A World Of Technology, So Without Visuals In Any Presentation, The Pupil May Not Learn Well Especially At The Primary School Level (smaldino, Lowther & Russell, 2018). Present Day Pupils Are More Used To Absorbing Information From The Screen Than From The Printed Page, Especially For Primary School Pupils (lytras, Gasevic, Ordonez & Huang, 2018). Primary School Teachers Need To Keep In Mind That They Are Preparing To Teach In The 21st Century And That They Are Teaching 21st Century Children Who Have Become Accustomed To 21st century Technology. To This End, Primary School Teachers Need To Prepare Their Lessons To Capture The Attention Of The Learners. This Therefore Calls For Innovative Teaching Methods That Will Enhance Pupils' Learning Outcomes In Primary School.

Innovation Means A New Or Novel Way Of Doing Things. Innovative Teaching Methods Involve Employment Of Teaching Strategies Capable Of Challenging And Engaging The Learners (changawa, 2019). It Is Obvious That Teaching Is Challenging, But The Teacher Owes It A Duty To Make Sure Learning Has Taken Place. The Teacher Achieves This By Using Appropriate Techniques To Impact Knowledge To The Learners Make Them Genuinely Interested And Participate Effectively During The Teaching And Learning Process. Teachers Have To Think Differently From What They Are Used To In Order To Come Up With Innovative Teaching Methods. Teaching Methods Are Sometimes Called Teaching Strategies Or Instructional Strategy. More Than One Innovative Teaching Methods Can Be Employed By The Teacher In A Particular Lesson, And Some Teaching Methods Are Class Specific (nwaeze, Onuoha, &ukogo, 2016). For Example, Methods For Teaching Secondary School Students May Seem High, While That For Primary School Pupils May

Be Very Low For Primary Pupils. The Essence Of Adopting Effective Teaching Methods By The Teacher Is To Increase Pupils' Engagement And Understanding Of The Topic To Improve Learning Outcome. According To Davis (2017), Education Should Engage The Pupil. This Means That Pupils Should Be Attentive, Curious, Optimistic, Interested To Learn And Passionate While Being Taught. This In Turn Increases The Pupils' Performance. Changawa (2019), State That Pupils' Learning Outcome Will Be Improved If Modern Technology And Innovative Teaching Methods Are Used.

Recent Empirical Studies Have Indicated That Some Of The Innovative Teaching Methods Produced Better Result In Terms Of Pupils' Learning Outcomes. For Instance, Lamidi, Oyelekan And Olorundare (2015) Conducted A Study To Determine The Effects Of Mastery Learning Instructional Strategy On Secondary School Students' Achievement In Mole Concept, A Topic That Has Been Empirically Identified As Difficult To Understand By Students. It Was Found Out That Students Taught Using The Mastery Learning Instructional Strategy Performed Significantly Better Than Their Counterparts In The Control Group. In A Study Of The Impact Of Two Innovative Instructional Strategies On Junior Secondary School Students' Academic Achievement In Basic Science By Oyasola And Adegoke (2021) Revealed That Students Who Were Taught Using Innovative Teaching Methods (guided Inquiry And Discovery Teaching Strategies) Performed Higher Than Those That Were Taught Using Conventional Teaching Strategy. Changawa (2019) Found A Significant Positive Influence Between Innovative Teaching Methods And Learning Outcome. Similarly, Adebisi And Lawal (2021) Reported A Significant Positive Correlation Between Innovative Teaching Methods And Academic Performance. Also, Mbida And Nsongo (2019) In The Study Of Innovative Teaching Methods On Academic Performance In Akamkpa Local Government Area Revealed That Learners Who Were Taught Using Innovative Teaching Methods (peer Tutoring, Problem-based Learning, Discovery Learning And Cooperative Methods) Achieved Significantly Higher Than Those Taught Using The Conventional Method. Examples Of Innovative Teaching Methods According To Nwaeze, Onuoha And Ukogo, (2016) Include Multimedia Learning Process, Role Playing And Scenario Based Teaching Methods, Activity-based And Z To A Approach. Other Innovative Teaching Methods Are Think-pair-share Collaborative Teaching Method, Differentiation Instructional Strategy, Jigsaw Method, Concept Mapping, Cooperative Learning, Peer Tutoring, Experiential And Generative Learning Strategies (oyasola& Adegoke, 2021). The Following Are Advantages Of Innovative Teaching Methods: It Is Good For Learners With Low Attention Span As It Effectively Retains Pupils' Attention Because Of The Colourful Interface., They Are More Learners-centred Than Traditional Methods As The Pupils Do Most Of The Work While The Teacher Only Guides; Helps To Create A Sense Of Responsibility, Accomplishment And Maturity In Pupils As They Are Solely Responsible For Every Decision They Take In The Course Of Their Projects And Assignments; Enables The Pupils To See The Practical Applications Of The Concepts They Have Been Taught As They Try Their Hands On What They Were Taught; Create A Long Lasting Memory/correlation Of A Concept; Facilitates Collaborative Work Among Pupils. In Collaborating During Assignments, Peer Tutoring Is Often Possible Among Pupils Where Knowledge Is Passed On From Person To Person And Pupils Tend To Perform Better When Taught Using Innovative Teaching Methods (onwukwe, 2010). Nwaeze, Onuoha And Ukogo (2016) Assert That The Application Of Innovative Teaching Methods Is Dependent On Teacher's Qualification And Teaching Experience. Achor, Samba And Ogbaba (2010) Discovered That More Experienced Science Teachers Had Higher Mean Utilization Scores For Innovative Teaching Strategies Than The Less Experienced Ones. Hence, This Study Sought To Find Out The Role Of Technology And Innovative Teaching Methods In Improving Primary Education Outcomes In Otukpo Local Government Area Of Benue State, Nigeria

Statement Of The Problem

With The Current Transformation In The Educational Sector, Learning Instruction Has Shifted Focus Away From A Teacher-centered Approach To Learner-centered Approach, And From A Single Instructional Medium To Use Technological Tools Along With Innovative Methods Of Teaching To

Enhance The Educational Outcome (zubairu & Umar, 2020).many Studies On The Role Of Technology And Innovative Method Of Teaching In The Classroom Have Shown That There Can Be A Significant Positive Impact Of Technology And Innovative Teaching Methods On Educational Outcomes. However, It Seems Many Primary School Teachers In Otukpo Local Government Area Have Not Key Into The Significant Role Of Technology And Innovative Teaching Method That Could Enhance Primary School Educational Outcome As Observed By The Researcher. It Should Be Noted That Primary School Education Is The Foundation For Further Studies And Any Inadequacies At This Level May Cause Serious Challenges At Higher Levels Of Education. This Calls For Urgent Need For Primary School Teachers To Embrace The Enormous Roles Of Technology And Innovative Teaching Methods To Improve Primary School Education. Therefore, The Problem Of This Study Is To Investigate The Role Of Technology And Innovative Teaching Method In Improving Primary Education Outcome In Otukpo Local Government Area Of Benue State, Nigeria. Specifically, The Study Sought To:

1. Find Out If The Use Of Technology And Innovative Teaching Method Has Influence On The Primary Education Outcomes In Otukpo Lga.
2. Determine The Difference In The Mean Influence Of Technology And Innovative Teaching Method On Primary Education Outcomes Between Teachers With High Usage And Those With Low Usage.

Research Questions

This Research Sought To Provide Answers To The Following Questions:

1. What Is The Influence Of The Use Of Technology And Innovative Teaching Methods On Primary Education Outcomes In Otukpo Lga?
2. What Is The Difference In The Mean Influence Of Technology And Innovative Teaching Methods On Primary Education Outcomes Between Teachers With High Usage And Those With Low Usage?

Hypotheses

The Following Null Hypotheses Were Formulated And Tested At 0.05 Level Of Significance:

1. There Is No Significant Impact Of The Use Of Technology And Innovative Teaching Methods On Primary Education Outcomes In Otukpo Lga.
2. There Is No Significant Difference In The Mean Influence Of Technology And Innovative Teaching Methods On Primary Education Outcomes Between Teachers With High Usage And Those With Low Usage.

Research Method

This Study Employed A Survey Research Design. The Study Was Executed Within The Confines Of Otukpo Local Government Area In Benue State, Nigeria. The Population For The Study Was 845 Teachers In The 2022/2023 Academic Session Out Of Which A Sample Of 85 Teachers Were Obtained Using Multistage Sampling Involving Purposive, Stratified And Simple Random Sampling. One Instrument Was Used Titled: Role Of Technology, Innovative Teaching Methods And Educational Outcomes Questionnaire (rtitmeoq) Developed By The Researcher. The Instrument Had Two Sections AAnd B. Section A Sought The Name Of The School And Whether Teachers' Use Technology And Innovative Teaching Method Or Not While Section B Contained 14 Items Which Sought Information On The Role Of Technology And Innovative Teaching Method. The Options Provided Were Presented On A Four Point Scale With Options Such As Strongly Agree (sa) = 4 Points, Agree (a) =3 Point, Disagree (d) =2 Points And Strongly Disagree (sd) =1 Point. These Items Are Both Positive And Negative. The Negative Items Were Scored In Reverse Order.

To Ensure The Validity Of The Instrument, They Were Presented To Three Experts, Two In The Department Of Educational Foundations And One In The Department Of Mathematics And Science Education, All From Benue State University, Makurdi With The Request That They

Examine The Appropriateness Of The Instruments In Terms Of Relevance To Research Objectives, Language Use And Clarity Of The Items. All Their Comments, Suggestions And Corrections Were Duly Effected In Order To Modify The Instrument To Be Able To Measure What They Were Expected To Measure. To Establish The Reliability Of The Instrument, A Trial Test Using Rtitmeoq Was Conducted On 10 Respondents Who Were Not Part Of The Main Study. The Reliability Coefficient Of Rtitmeoq Was Determined Using Cronbach Alpha To Be 0.88. The Instrument Was Considered Reliable. This Is In Agreement With Emaikwu (2013) Who Asserts That An Instrument With Reliability Of 0.55-0.99 Is High For Use In Research. The Researcher Visited The Sampled Schools And Sought Permission From The Head Teachers. The Instrument Was Administered By The Researcher With The Aid Of Head Teachers As Research Assistants Who Were Clearly Informed On The Objectives Of The Research. Mean Scores And Standard Deviations Were Used To Answer The Research Questions. Items With Mean Ratings Below 2.50 And Above 2.50 Were Regarded As Having Low And High Impact Respectively. The Chi-square And T-test Were Used To Test The Hypotheses At 0.05 Level Of Significance.

Results

The Results Of This Study Were Presented According To Research Questions Asked And Hypotheses Formulated.

Research Question One

What Is The Influence Of The Use Of Technology And Innovative Teaching Methods On Primary Education Outcomes In Otukpo Lga?

Table 1:

Mean And Standard Deviation Of The Influence Of The Use Of Technology And Innovative Teaching Method On Primary Education Outcomes

S/No	Items	X	SD	Remark
1	Technology tools such as word processors, spreadsheets help keep records to enhance my pupils learning.	1.47	0.69	LI
2	Technology tools like power point, digital media help present information to facilitate pupils' proper learning.	2.92	0.89	HI
3	Technology oriented managing tools like grade books, attendance, seating charts foster pupils' learning.	2.29	0.82	LI
4	Technology has addressed challenge of assessing my pupils to enhance their performance.	2.57	0.99	HI
5	Technology is helpful in analysing students' performance scores to detect trend, provide remediation to learners.	3.23	0.56	HI
6	Technology oriented tool facilitate teaching of specific concepts to improve learning outcomes.	3.02	0.76	HI
7	Technology helps in documenting professional growth to enhance my pupils' learning outcomes.	2.30	0.96	LI

8	Technology tools like media for auditory, visual have helped support my pupils' learning styles.	3.35	0.75	HI
9	Technology tools provide collaborative problem-based activities that enable my pupils' to analyse, synthesize information to boost their learning outcome.	2.93	0.63	HI
10	Creating collaborating group activities helps encourage pupils to participate, learn with understanding.	2.53	0.79	HI
11	I allow pupils to brainstorm, think out their ideas to improve their learning outcome.	3.29	0.86	HI
12	I use engaging interactive activities like graphic organizer to illustrate difficult topics to enhance learning.	2.77	0.74	HI
13	I guide students to discuss on what they learn in class, provide timely feedback, and correct their mistakes.	2.91	0.94	HI
14	Effective evaluation of learning, positive teacher-learner interaction helps ensure meaningful learning, performance.	3.09	0.89	HI
Cluster Mean		2.76	0.81	HI

From Table 1, It Can Be Seen That All The Items Have Mean Ratings Above 2.50 Indicating A High Influence. Only Items 1, 3 And 7 Have Mean Ratings Below The Benchmark Of 2.50. A Grand Mean Of 2.76 And Standard Deviation Of 0.81 Are Indication That The Items In Table 1 Reveals That The Use Of Technology And Innovative Teaching Method Has Influence On Primary Education Outcomes In Otukpo Lga. The Average Standard Deviation Value Of 0.81 Indicates That The Difference In The Responses Of The Group Is Very Small.

Research Question Two

What Is The Difference In The Mean Influence Of Technology And Innovative Teaching Methods On Primary Education Outcomes Between Teachers With High Usage And Those With Low Usage?

Table 2:

Mean And Standard Deviation Of The Difference Of Technology And Innovative Teaching Method On Primary Education Outcomes Between Those With High And Low Usage

Technology and Innovative Teaching Method	N	Mean	SD	Mean Difference
High Usage	63	3.06	0.39	0.99
Low Usage	22	2.07	0.86	

In Table 2, Teachers In Primary Schools With High Usage Of Technology And Innovative Teaching Methods Had A Mean Rating Of 3.06 With Standard Deviation Of 0.39, While That Of Those With Low Usage Had 2.07 With A Standard Deviation Of 0.86. This implies that Teachers In Primary Schools With Higher Usage Of Technology And Innovative Teaching Methods Have High Mean Rating Than Those With Low Usage. Moreover, The Disparity In The Difference In The Mean Influence Was 0.99 In Favour Of Teachers With High Usage Of Technology And Innovative Teaching Methods. The Standard Deviation Values Of 0.39 For Teachers With High Usage And 0.86 For Teachers With Low Usage Is An Indication That The Responses Of The Formal Are Better Clustered Around The Group Mean While Those Of The Latter Are Dispersed From The Group Mean.

Hypothesis One

There Is No Significant Influence Of The Use Of Technology And Innovative Teaching Methods On Primary Education Outcomes In Otukpo Lga.

Table 3

Pearson's Product Moment Correlation Coefficient Of Influence Of The Use Of Technology And Innovative Teaching Method On Primary Education Outcomes

Variable	N	$\bar{X}$	SD	df	Cal. r-value	P-value
Technology and Innovative Teaching	38	16.12	4.53	83	.612*	.000
Education Outcomes	13	20.10	4.22			

Table 3 Indicates That The Calculated R-value Is .427 With A Correspondence P-value Of .000 Which Is Less Than 0.05 Level Of Significance. Since The Calculated P-value Of Less Than The 0.05 Alpha Level, Hypotheses One Is Hereby Rejected. This Implies That The Use Of Technology And Innovative Teaching Method Has Significant Influence On Primary Education Outcomes In Otukpo Lga.

Hypothesis Two

There Is No Significant Difference In The Mean Influence Of Technology And Innovative Teaching Method On Primary Education Outcomes Between Teachers With High Usage And Those With Low Usage.

Table 4:

T-test On The Difference In The Mean Influence Of Technology And Innovative Teaching Method On Primary Education Outcomes Between Teachers With High Usage And Those With Low Usage

Group	N	Mean	SD	Df	t value	P	Remark
High Usage	63	3.06	0.39	83	17.26	0.005	Significant
Low Usage	22	2.07	0.86				

Data In Table 4 Revealed That $T = 17.260$, $P = 0.005 < 0.05$. Hence, The Null Hypothesis Was Rejected. This Means That There Is A Significant Difference In The Mean Influence Of Technology And Innovative Teaching Methods On Primary Education Outcomes Between Teachers With High Usage And Those With Low Usage.

Discussion Of Findings

Findings Of This Study Reveal That, The Use Of Technology And Innovative Teaching Method Has A Significant Influence On Primary Education Outcomes In Otukpo Lga. this might be the ability of use of technology to enable students always have access to information and materials from the internet, develop friendly character traits, exposure to meaningful teaching practices as teacher's competence is facilitated through access to tips on better ways of preparing and presenting lessons including modern teaching methods and students' privilege to learning at anytime, anywhere cause them to perform academically high. The finding is line with Enyi, Uko, Jairus *Et Al* (2017) study which showed that the mobile phone (technology) usage among secondary school students had a significant relationship with their academic performance in Oju Local Government Area. The finding also agreed with the view of Bilesanmi-awoderu and Idowu (2012) showed that students in the two cooperative learning strategies (learning together and jigsaw ii) groups got higher immediate and delayed academic achievement mean scores than the students in the conventional-lecture group. Learning together and jigsaw ii cooperative teaching strategies were found to be more effective in enhancing students' academic achievement and retention in basic science more than the conventional-lecture.

Another findings of this study also showed there is significant difference in the mean influence of technology and innovative teaching method on primary education outcomes between teachers with high usage and those with low usage. The findings in this study corroborate Majumdar (2005) who observed that most teachers who receive ICT training as part of the professional development (pd) programs still lacked the self-reliance needed to integrate ICT in teaching and learning because in most cases due to time limitations the training only focused on computer applications.

Conclusion

In conclusion, the study underscores the paramount importance of incorporating technology and innovative teaching methods in primary education within Otukpo Lga, demonstrating their substantial positive influence on educational outcomes. Furthermore, the identified significant disparities between teachers with high and low usage highlight the need for targeted interventions to ensure a more equitable integration of these methods, ultimately fostering enhanced educational achievements across the region.

Recommendations

Based On The Findings In This Study, The Following Recommendations Are Made:

1. Implement Targeted Professional Development Programs For Teachers In Otukpo Lga To Enhance Their Proficiency In Utilizing Technology And Innovative Teaching Methods.
2. Explore Strategies To Bridge The Gap Between Teachers With High And Low Usage Of Technology, Such As Mentorship Programs Or Collaborative Workshops, Aiming For A More Equitable Impact On Primary Education Outcomes.

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