



# Integrating Artificial Intelligence in Personalized Learning in East Africa

Bitalo J. U.

Faculty of Education Kampala International University Uganda

## ABSTRACT

This paper proposes a holistic model for integrating Fourth Industrial Revolution (4IR) technologies, particularly Artificial Intelligence (AI), to foster personalized learning in East Africa. Despite the adoption of individual educational technologies, the region still faces challenges in achieving personalized learning due to limitations in pedagogy, clear learning objectives, high student engagement, and ongoing feedback mechanisms. By leveraging AI, educators can tailor learning experiences to individual student needs, thereby enhancing educational outcomes. This review evaluated AI-based models for assessing and adapting to learner readiness, creating adaptive learning pathways, and influencing educational policy in East Africa.

Keywords: Artificial Intelligence, Personalized Learning, 4IR Technologies, East Africa, Adaptive Learning, Educational Technology, Student Engagement and Learning Analytics

## INTRODUCTION

But many parts of the world, specifically in East Africa, still struggle to achieve some essential prerequisites of personalized learning, specifically increased use of pedagogy, clear learning objectives, high student engagement, and ongoing feedback that can contribute to personalize learning [1]. Such challenges lead to teachers' "one size fits all" approach to teaching and learning [2]. Despite the quick adoption of individual technologies like interactive boards, technology acceptance literature is replete with studies that have sought to identify the determinants and the use of technology individually [3]. However, the adoption of 4IR-related technologies to foster personalized learning in East Africa has received little scholarly attention, and no model seeks to explain its use collectively as compared to their single use [4-8]. Therefore, the aim of this paper is to propose a holistic model for the adoption of 4IR technologies in East Africa to promote personalized learning in the future [9-12]. With the advent of the Fourth Industrial Revolution (4IR) technologies such as Artificial Intelligence (AI), there is an onset of technological advancements that can redefine education in novel ways, introducing us to an interesting phenomenon called Personalized Learning [13-18]. Personalized learning, as illustrated, employs technology and data to meet each student where they are, keeping them on a level appropriate for their academic progress, with educators often using data and analytics to identify the strengths and weaknesses of each student and guide them to learn at an optimal pace [11]. Consequently, educators can determine when it is right to employ a teacher, small group, larger group, a software solution, or a combination of these in the learning process [7]. Thus, technology can be used to enhance the segregation and personal guidance of learning for each student [19].

### Background and Rationale

Models of educational systems that support the student's particular needs have shown to be sometimes more efficient than educational systems that are not implemented with these technologies [20-24]. However, the incorporation of educational models into the classroom is a continuous challenge, not only due to the students' diversity criteria (prior knowledge, learning capacity, cognitive styles, personality traits, learning preferences) but also because of the cost-benefit relationship of them and because educators are comfortable with the use of new educational models that integrate educational technologies with artificial intelligence (learning object classifiers, question and answer converters, and intelligent tutors, etc.) which are absolutely necessary for the assessment, content flash, and follow-up of the pupils both inside the classroom and at home via the Internet [25-27]. The demand for personalizing education in schools and homes has made it necessary to develop new free software systems related to open-source tools and assessment systems, and to develop completely new software systems using artificial

<https://rjournals.com/research-in-education/>

intelligence to provide a personalized support platform that will facilitate the work of teachers and students [22]. In this way, access to the students' personalized education systems will be possible for families who do not have economic resources. The model proposed to assess the pupils is shown to be more efficient than present models [17]. The teaching materials are always adapted to the pupils' real knowledge, generating questions related to the materials provided. The improvement in the teaching materials is evaluated and the results are improved. With this, the pupils have been more motivated to do what they are asked to do [9]. A final study about the experiences being carried out with the platform. African nations, especially Kenya, are in the process of implementing a personalized education model. This is based on economic and technological advantages [28]. The model is increasingly being used in both developed and developing countries [29]. The main objective of this education and pedagogy model is to use information and communication technologies (ICT) to provide personalized assessment and education support for students' specific individual needs [23]. The main technological contribution of this model is to use artificial intelligence in education, which has shown to have improved the quality of assessment models and the development of interactive systems that are able to provide personalized support in schools and via the Internet [30].

### **Artificial Intelligence in Education**

AI not only motivates education to shift from labor-intensive to technology-driven, but also reshapes educational philosophy, educational objectives, education concept, education model, and education system, making education smarter, more flexible, and more personalized [31]. Introducing AI into practical teaching, stimulating interest in AI learning is an important guarantee for promoting educational reform. Impressing students with profound practical significance, active, and participatory AI knowledge, helping them understand the profound changes of educational practice, acquainted with new theories and methods, and determine their learning goals is the key to AI education [32]. The integration of practical activities and the development of innovative thinking through AI learning is also the most advantageous way for talents to bring the greatest value to society and to cultivate future employment competitiveness [33]. The use of AI technology has been significantly involved in educational practice to help students learn in particular settings [26]. Some researchers have also incorporated AI into instruction design, making AI participate in curriculum tracking participant learning and adjusting participant learning paths, and assisting the teacher to conduct intelligent diagnostics for students' comprehensive development issues. Like the development of intelligent educational technology represents that educational theory and means have changed and the new step and social demand, many countries have issued "Artificial Intelligence + Education Plans" to promote the integration of technology in primary and secondary education [34].

### **Overview of AI in Education**

Accessibility and quality of education at the primary and secondary school levels still remain major problems in East Africa [21]. There is a great need to implement strategies that can influence/enhance learning, literacy, and socio-relational skills of pupils wherever they are, and that can support learning professionals in carrying out teaching and organization activities [24,13,29]. This paper focuses on the application of AI in classroom education to enable personalized and inclusive methodologies that permit support to each pupil in learning, according to individual necessities, characteristics, learning processes (pace), and current achievements (results) [35]. The aim is to develop a methodical approach to support peer education in the classroom at primary and secondary level and providing tutoring, effecting metacognitive reflection, improving strategic abilities related to study, communication, and social exchange [36]. The concept of artificial intelligence (AI) in the field of education is not new. Research in the area has been ongoing for decades and has shown that AI can potentially play a very important role in the innovation of education. For instance, various AI methods such as expert systems and intelligent training systems have been developed to assist in delivering education at the basic and university levels. Despite the growing rates in emerging technology, there has been little progress on the routine use of AI methods in primary and secondary schools [37]. The primary aspect of education where AI has been widely applied is that of personalized e-learning, and this was primarily done to assist learners around the age of 15 and above to learn complex subjects, normally from a distance [38]. Although the application of AI in personalized learning from a distance solves some of the constraints in curriculum delivery, most of East African school learners at these levels have access to learning facilities, often in the form of a one teacher-school ratio, although quality of education and teacher experience are issues of concern [39].

### **Benefits and Challenges**

The social connections are the other major challenges posed by the use of AI in personalized learning [34]. As AI advances to more advanced capabilities, we need to model the type of curiosity we want students to have. Students need to know that questioning the software's decision is acceptable. Small

<https://rijournals.com/research-in-education/>

challenges need to be created to expose a wider variety of students' backgrounds to greater complexities [40]. One of the biggest challenges of integrating AI in personalized learning is ensuring that every student has access to the right technology [32]. Many students do not have access to devices or Wi-Fi. Another challenge is around recruiting and developing teachers. All teachers need help responding to the variety of student needs in their classroom, from students who want to move ahead quickly to those who need more support to catch up [41]. Furthermore, AI raises issues around data, privacy, and security. These concerns are real and important aspects that need to be resolved. Some of the benefits that come with integrating AI in personalized learning include maximizing the value of learning time and meeting the needs of all students. With AI, every student gets the personalized attention that they need to have a successful learning pathway and maximize the value of their learning pathway. Outside East Africa, personalized learning is being embraced by numerous teachers, and some of them are integrating AI. The advanced countries are experiencing so much from AI, and they know the risks and benefits [42]. This increases the need for developing countries like East Africa to know to what extent the use of AI in personalized learning is beneficial and challenging. This will enable them to take advantage of the benefits while at the same time finding solutions to the challenges [43-45].

### **Personalized Learning in East Africa**

Personalized learning is a teaching model based on having smaller groupings, or one-to-one, of students in which they receive more individually tailored instruction than in traditional models, and the use of promotion of the use of digital technology in instruction [12]. There is substantial hope that, despite the challenges in implementation, personalized learning model has the potential to provide solutions to the East African education crisis resulting from excessively large class sizes and varying performance levels [32]. Rapid and efficacious methods of determining subject understanding are now available thanks to development in personalized learning tools that are driven by artificial intelligence [24]. The well-built technical abilities of these personalized learning tools combined with the novel research in the field of educational data mining – translating these massive trails of fine-grained data into tools and information realizable by teachers and school administrators interactively, have led to numerous study schools in Kenya and Uganda to connect PL tools with the traditional schooling model [22]. Preliminary studies indicate that students who are in schools using these PL tools performed better than their counterparts in conventional schools [46]. These preliminary studies have not only led to the acknowledgment of the previously understood PL theoretical underpinnings but have also recognized innovative implementations including teachers' responsibility, school administrators and type of curriculum material. Despite the multidimensional nature of education, these findings inform us that teachers can significantly influence the gain in performance leveraging students from these types of technology—a definitive finding from starkly disparate US educational technology revolutions experiences [41]. These broad-scale PL tool innovations that use artificial intelligence techniques square with the modern endeavors to introduce minor advances in universal foundational capital theory or technology-based capital economic models that help to explain economic development and growth. Understanding the interactions and complementarities between these technology tools and IT and instructor capital can help formulate the school-based digital strategies that are required for enhanced student performance [47-51].

### **Current Landscape**

While it is true that automation specifically will happen in the future, AI is already influencing education. Online learning platforms have integrated AI and machine learning to adapt content, user interface, and experience [14]. Virtual teaching assistants perform tasks such as sending reminders, reading questions aloud, and giving feedback to students. Technologies that use natural language processing present learners with data, essays, and open-ended responses in a way that allows them to collect data and foster reflection on language use trend over time [18]. Massachusetts Institute of Technology is using AI to teach introductory physics courses. In the Kenyan context, traditional education systems have frequently been criticized for the poor teaching methods that lead to poor learning outcomes [19]. Despite a long history of educational policy change and reforms, there has been very minimal implementation of policy options that are able to show concrete signs of addressing issues to do with poor learning outcomes by pupils or even average performance in schools. Such slow progress is unfortunate given the key role of education in development and changes in society, especially at a time of globalization, dramatic technological advances, demographic expansions, and international goals of achieving growth with equality and the elimination of poverty [21]. While technology is no silver bullet, technology-driven initiatives are promising some revolutionary changes within schools, leading to the anticipated improvement in the learning process [52].

### **Opportunities and Challenges**

Assistant technologies such as Alexa by Amazon and Google Assistant are AI-powered and enable people to interact with devices, assisting them to answer their questions, opening applications, and playing the desired music channel [38]. They can also sing them an already learned song setting to a comfortable tune, and provide up-to-date news and weather [42]. While there has been little research work conducted on sustainable society aspects, experiments have been conducted on how these tools can be used for GPSR, explosive ordnance recognition, and other minor problems, healthcare, and taxi operators [53]. We know only of four research studies that have been conducted on individualized educational functionality in teaching and learning skills with Alexa by Amazon and two research studies with Google Assistant. Of these few reports, only one is about individualized education skills in a classroom setting, while the rest were conducted with different groups and were limited to basic subject content [54]. Tasks such as 'help me with my Mathematics homework', content identification in the syllabus, and pronunciation issues from multilingual backgrounds were addressed and used for research inquiries [55]. In addition, there is a need for standard baseline developmental data models, instance-level quantitative data, and algorithms from continuous research to develop more applications that meet the needs of children in various regions, of different age groups, gender, race, and learning challenges, more accurately and with affordable voice-enabled technology [56]. The use of low-cost devices, tablets, and smartphones enables the individual pace of instruction and the ability to generate assessment information quickly with minimal to no back-and-forth teacher technology [43]. This enables one-on-one instruction while using a personalized learning approach, making it easier to measure learning outcomes of personalized learning. Machine learning methods provide a breakthrough in producing completely automated teachers that display a customizable dialogue by using applications that incrementally get to know and understand the student. In addition, personalized learning attracts politicians, whether decisively or cautiously, across the ideological spectrum. However, debates continue among teacher unions and teachers [41]. Yet, to date, only a tiny fraction of what makes classroom teaching has been digitized. Personalized learning integrates several technology-assisted instructions and individualizes data technology to increase learner achievement and optimize learning for all learners [35]. While personalized learning is still a concept or aspiration in East Africa, each country in the region is at different levels of realizing personalized learning [43]. For instance, Rwanda's government is partnering with BRAC International to provide personalized literacy instruction through phone reading applications that have shown significant growth in reading ability. Lumidada is working to establish partnerships across East Africa, with the aim of enlisting 'mini-franchisers' to sell its kits with local language instructions country by country [57].

### **Integration of AI in Personalized Learning**

One study, which adopted a vision-based method for unobtrusively acquiring instructors' behavior during teaching, has led to an investigation on improving instructional immediacy that results in better students' learning activities and satisfaction [32]. By identifying the moment-to-moment interactions during teaching, they can offer personalized advice on aspects that an ordinary self-reflection, a common teacher's self-improvement approach, hardly gets at due to its potentially emotionally biased observation [45]. In the domain of AIED, the learned policy can automate graduates' vocational content creation process in specific problem domains so that the curated content meets the requirements of personalized learning [43]. Differently categorized textual content reaches and teaches different learners comprising different levels of learning capabilities in the personalized learning gamified course environments. The benefits of combining AI and personalized learning in the integration of the educational processes are evident. This integration can occur in the form of materials that incorporate visual recognition capabilities that can help in the better understanding of its curriculum, marking creative writing, and validating laboratory procedures [57]. The use of Artificial Intelligence can also be a back-end service that improves the efficiency of online education marketplace. The connection of a context-based chatbot to the digital content feeds allows the students to post questions while attempting interactive activities with personalized responses. This chatbot system gives the student answers based on their strengths and on the real-time capabilities to colors in their personality [58-60].

### **Case Studies and Best Practices**

There is already some data about what works in personalized learning and there are a number of practical references that explore case studies, best practices, and conversations around implementation [61]. The following section aims to expand upon insightful conversations from various papers within the industry but also includes reviews of both successful and unsuccessful technological approaches to personalized learning [62]. It will include a broad sampling from a large range of relevant reference presentations on this topic including: McKinsey and Company's "How US schools can help students catch up", Nesta's "The EdTech Science of Learning Program", New America's "Personalized Learning: What it Looks Like



<https://rjournals.com/research-in-education/>

in Practice", Research in King Center "Transforming teaching by optimizing understanding and engagement", CATO Institute's "Making innovation work in Education", among others [39]. The field of personalized learning is still young, with interest growing more rapidly in recent years than at any other time up to now [45]. Many different organizations and companies have been gathering their experiences in providing personalized learning to broaden understanding about what it is and how it can be effectively developed and provided to diverse learners. In this provision, leaders are demonstrating willingness to innovate, sometimes to fail, but also to scale up what works. Personalized learning that is both effective and scalable today often leverages technology or directly incorporates Artificial Intelligence (AI) in the design of AI-driven algorithm [63].

### **Ethical Considerations**

Inclusivity and equity considerations imply that AIPE should be designed to benefit learners from rich and poor backgrounds by accurately recognizing and understanding their unique learning needs rather than further entrenching the digital divide by favoring the privileged. AIPE should therefore be developed and used with caution to ensure adherence to legislations and regulations for PE, such as the Sustainable Development Goals, national agendas, and commitment to inclusive education, gender equity, and fairness [65]. Aspects of diversity should be addressed in a timely manner with the knowledge of the stakeholders. AIPE developers should ensure that gender, culture, ability level, socio-economic background, and language are taken into consideration in the learning process. AIPE can exacerbate the digital divide by its very nature with the potential to reinforce imbalances in the quality of education received [66]. Successful implementation of policies aimed at ensuring that AIPE serves to bridge the gap will depend on integrating ways that guarantee access to AIPE with appropriate mechanisms to hold implementers accountable for producing trustworthy AI results. Ethics in the use of AI in PE can be organized along the following dimensions: accuracy and transparency related concerns, data quality, privacy and data protection aspects, trust and accountability, and the potential to exacerbate social inequalities and discrimination [67]. They are equally specific to the PE context with potential risks to the perceived and real value contributed to the sector [68-71]. Recognizing the uniqueness and challenges posed by the PE sector in developing and emerging countries, the Ethical Guidelines for Trustworthy AI recommended by the AI High-Level Expert Group were reviewed with additional AI for Education publications to propose AI guidelines customized to AIPE adapted to specific African needs. Successful implementation of the policies will depend on the availability of data, use of appropriate technologies that preserve privacy and trust, inclusion of all the relevant stakeholders, adequate transparency and access to information, and appropriate mechanisms in place to hold implementers accountable for producing trustworthy AI in PE [72].

### **Conclusion and Future Directions**

East Africa faces significant educational challenges, particularly in rural areas. Personalized learning, supported by AI, can address these challenges by tailoring education to individual needs. This paper highlights the potential of AI to enhance personalized learning and proposes a model to integrate AI in East African education. Future research should focus on developing and evaluating AI-based personalized learning models, ensuring ethical considerations, and influencing educational policy to support technology-driven learning approaches.

### **REFERENCES**

1. Silaji Turyamureeba (2018) Motivational Practices and Teachers' performance In Private Secondary Schools In Mbarara District, Uganda. Kampala International University, College of Education, Open and Distance Learning. 1 (1) 1-101.
2. Silaji Turyamureeba, Kayindu Vincent, Bisaso Ritah (2020). Fringe Benefits, Administrative Support And Physical Work Environment As Correlates Of Teachers' Performance In Private Secondary Schools In Mbarara District, Uganda. Research journal's Journal of Education. Vol. 8 | No. 4 May | 2020 ISSN 2347-8225
3. Turyamureeba Silaji and Kyarikunda Zaitun (2024). Examining the Impact of Human Capital Development on Poverty Reduction: A Case Study of Bushenyi District, Uganda. INOSR HUMANITIES AND SOCIAL SCIENCES 10(1):44-52. <https://doi.org/10.59298/INOSRHSS/2024/101.445237>
4. Tukur Muhammad, Mbabazi Asiati, Umar Sodangi, Stella Steddy, Silaji Turyamureeba & Kule Ashirafu Masudi (2024). AN OVERVIEW OF GENDER RESEARCH IN SCIENCE AND MATH EDUCATION FROM A NIGERIAN PERSPECTIVE. African Multidisciplinary Journal of Development (AMJD). 12 (3):207- 231. <https://doi.org/10.59568/AMJD-2023-12-3-18>

5. Wilson Mugizi, Benard Nuwatuhaire, Silaji Turyamureeba (2019). Organisational structure and employee commitment of academic staff in a private university in Uganda. *Journal of Humanities and Social Science*. 24 (4) 72-83: DOI: 10.9790/0837-2404097283
6. Y Katureebe, S Turyamureeba, A Rahim, CE Eze (2023). The Effect of Financial Management on the Learning Ability of Students in Government-Aided Primary Schools in Ibanda Municipality Uganda. *International Journal of Humanities, Management and Social Science*. 6 (2) 109-118; DOI: 10.36079/lamintang.ij-humass-0602.600
7. FA Akorio, S Turyamureeba, A Tugume, VHU Eze (2024). Rural Tourism and Socio-Economic Development in Kalapatta Sub County Kabong District of Uganda. *Journal of Humanities and Social Sciences (JHASS)*. 6 (1) 31-38 : DOI: 10.36079/lamintang.jhass-0601.606
8. Turyamureeba Silaji (2018) Motivational practices and teachers' performance in private secondary schools in Mbarara District, Uganda. *Kampala International University*
9. Tukur Muhammad, Mbabazi Asiati, Umar Sodangi, Stella Steddy, Silaji Turyamureeba & Kule Ashirafu Masudi (2024). USING THE DELPHA TECHNIQUE, TO REFINED SCIENCE LESSONS, ACTIVITIES, AND LOCAL RESOURCES TO CREATE A SCIENCE MODULE FOR TWO FEMALE SENIOR SECONDARY STUDENTS IN NIGERIA. *African Multidisciplinary Journal of Development (AMJD)*.12 (3) 250- 272: <https://doi.org/10.59568/AMJD-2023-12-3-20>
10. Silaji Turyamureeba and Julius Bitekyerezo (2023). Exploring Factors Impacting Teachers' Performance and Commitment in Primary Schools: A Case Study of Ryeru Sub-County, Rubirizi District. *INOSR ARTS AND HUMANITIES* 9(2):51-59. <https://doi.org/10.59298/INOSRAH/2023/2.6.4000>
11. Silaji Turyamureeba, Tukur Muhammad, Abdul Rahim and Kiyundo Zikanga (2023). Organizational structure and Academic staff Performances in Private Universities in Uganda. *IDOSR JOURNAL OF HUMANITIES AND SOCIAL SCIENCES* 8(2): 22-27. <https://doi.org/10.59298/IDOSRJHSS/2023/12.1.5100>
12. Silaji Turyamureeba, Tukur Muhammad, Abdul Rahim and Kiyundo Zikanga (2023). The impact of leadership competence and administrative leadership on higher education institutions around the world. *IAA Journal of Education* 9(2):109-116.
13. Ahabwe Jude Thaddeous, Silaji Turyamureeba, Namudu Aisha (2023). Analytical study on motivation and Pupils' performance in primary schools in Kagadi town council: A case study of Government Aided Primary Schools. *NEWPORT INTERNATIONAL JOURNAL OF RESEARCH IN EDUCATION (NIJRE)* 3 (2): 18-22.
14. Twesigomu Dick, Turyamureeba Silaji and Namudu Aisha (2023). The effect of nutrition and Pupils' academic performance: A case study of selected Primary schools in Muhororo Sub County, Kagadi district,Uganda. *NEWPORT INTERNATIONAL JOURNAL OF RESEARCH IN EDUCATION*. 3(2) :1-8 (NIJRE)
15. Silaji Turyamureeba and Richard Kaizire (2023). Impact of School Policies on Student Discipline in Fort Portal Municipality, Kabalore District. *INOSR HUMANITIES AND SOCIAL SCIENCES* 9(2): 1-11. <https://doi.org/10.59298/INOSRHSS/2023/1.5.4000>
16. Turyamureeba Silaji, Jovita Nnenna Ugwa, Abakunda Johnson, Kule Gerald, Kamami Wilson (2023). Navigating Global Challenges in Teacher Performance: Strategies. *INOSR ARTS AND HUMANITIES and Implications*. 9(2) 1-9: <https://doi.org/10.59298/INOSRAH/2023/2.1.4000>
17. Bulhan Samanya, Tom Mulegi, Ramadhan Badru Malinga, Hussein Muhaise, Wallen Atwijukire(2023). Examining the Influence of Regulatory Governance on Service Quality in Bwera District Hospital, Kasese District, Western Uganda. *IAA Journal of Management*. 10(2): 17-31.
18. Bulhan Samanya, Tom Mulegi, Ramadhan Badru Malinga, Hussein Muhaise, Wallen Atwijukire(2023). Exploring the Impact of Decentralization on Service Quality at Bwera District Local Government Hospital in Kasese District. *IAA Journal of Management*. 10(2):1-16.
19. Asanairi Bwambale, Tom Mulegi, Samanya Bulhan.(2024). The Effect of Laissez-Faire Leadership Style on Academic Performance of Primary School Pupils in Selected Primary Schools in Kasese District. *IAA Journal of Education* 10(1):23-28.
20. Asanairi Bwambale, Tom Mulegi, Samanya Bulhan.(2024) The Effect of Transactional Leadership on Academic Performance of Primary School Pupils in Social Studies in Munkunyu Sub County Kasese District . *IAA Journal of Education* 10(1):17-22.

21. Asanairi Bwambale, Tom Mulegi, Samanya Bulhan. (2024). The Effect of Transformational Leadership on Academic Performance of Primary School Pupils in Social Studies in Munkunyu Sub County Kasese District. *NEWPORT INTERNATIONAL JOURNAL OF CURRENT RESEARCH IN HUMANITIES AND SOCIAL SCIENCES* 4(2): 25-31.
22. Habimana Theogene, Tom Mulegi and Niyompano Hosee (2017). The contribution of financial ratios analysis on effective decision making in commercial banks *International Journal of Management and Applied Science*.3(6):33-40
23. Tom Mulegi (2022). Evaluation of the Skill Mix of Health Professionals in Government Regional Referral Hospitals in Uganda. *International Digital Organization for Scientific Research*.7(1): 43-68
24. Tom Mulegi. (2022). An Overview of Performance of Health Workers in Uganda. *IDOSR JOURNAL OF HUMANITIES AND SOCIAL SCIENCES* 7(1): 113-124.
25. Jovita Nnenna Ugwu, Tom Mulegi, Mbabazi Asiat, Chidinma Esther Eze . (2023). Prospects and Challenges of Sustainable Development in Africa. *IDOSR JOURNAL OF COMMUNICATION AND ENGLISH*. 8(1): 6-12.
26. Rachel Okwaja Puche and Eric Mabonga Ugwu Jovita Nnenna, Mbabazi Asiat, Tom Mulegi, Eze Chidinma Esther, Aleke Jude Uchechukwu.(2023). Mentorship and Increased Participation of Women in Politics: A Review. *NEWPORT INTERNATIONAL JOURNAL OF CURRENT RESEARCH IN HUMANITIES AND SOCIAL SCIENCES*.3(2):10-13.
27. Rachel Okwaja Puche and Eric Mabonga Ugwu Jovita Nnenna, Mbabazi Asiat, Tom Mulegi, Eze Chidinma Esther, Aleke Jude Uchechukwu. (2023). The Impacts of Teaching Strategies and Skills for Effective Learning of English Language in Cameroon. *NEWPORT INTERNATIONAL JOURNAL OF CURRENT RESEARCH IN HUMANITIES AND SOCIAL SCIENCES*. 3(2): 6-9.
28. Rachel Okwaja Puche and Eric Mabonga Ugwu Jovita Nnenna, Mbabazi Asiat, Tom Mulegi, Eze Chidinma Esther, Aleke Jude Uchechukwu (2023). The Benefits of Emotional Intelligence to Healthcare in Nigeria. *NEWPORT INTERNATIONAL JOURNAL OF CURRENT RESEARCH IN HUMANITIES AND SOCIAL SCIENCES*. 3(2): 1-5
29. Rachel Okwaja Puche and Eric Mabonga Ugwu Jovita Nnenna, Mbabazi Asiat, Tom Mulegi, Eze Chidinma Esther, Aleke Jude Uchechukwu(2023). Evaluation of Factors that Affect Teachers' Job Satisfaction and the Impact on Student Academic Performances. *NEWPORT INTERNATIONAL JOURNAL OF RESEARCH IN EDUCATION* 3(3):6-9
30. Rachel Okwaja Puche and Eric Mabonga Ugwu Jovita Nnenna, Mbabazi Asiat, Tom Mulegi, Eze Chidinma Esther, Aleke Jude Uchechukwu , (2023). Effect of Cultural Values on Character Formation: Implication for Education. *NEWPORT INTERNATIONAL JOURNAL OF RESEARCH IN EDUCATION* 3(3):1-5.
31. Mulegi Tom and Eleanor Kirahora Barongo Usman Bappi (2023). Examination of the level of governance in Gombe local government, Nigeria. *IDOSR JOURNAL OF BANKING, ECONOMICS AND SOCIAL SCIENCES*, 8(1):60-74.
32. Tom Mulegi, Usman Bappi and Bulus Jonah Saidu (2023). An Assessment of the Effect of Motivation and Affirmative Action on Employee's Performance in Gombe Local Government, Nigeria. *IDOSR JOURNAL OF BANKING, ECONOMICS AND SOCIAL SCIENCES* 8(1): 50-59.
33. Mulegi Tom and Eleanor Kirahora Barongo Usman Bappi. (2023). Examination of the level of community development in Gombe local government, Nigeria. *IDOSR JOURNAL OF ARTS AND MANAGEMENT*. 8(2): 48-62.
34. Tom Mulegi and Lubaale G. Barongo E. K., Busingye J. D. (2023). Gendered Economic Gap in Uganda: Education Attainment and Women's Access to and Land Ownership in Bunyoro Sub-region. *IDOSR JOURNAL OF ARTS AND MANAGEMENT*, 8(2): 1-10.
35. Mulegi Tom and Barongo Kirahora Eleanor Rukundika Francois, Mwaniki Roseann (2023). Evaluation of the effect of Education service interventions on re-integration of ex-combatant children in Haute-Kotto Prefecture of the Central African Republic. *NEWPORT INTERNATIONAL JOURNAL OF RESEARCH IN EDUCATION (NIJRE)* 3(2): 120-131.
36. Tom Mulegi and Lubaale G. Barongo E. K., Busingye J. D. (2023). Gendered Economic Gap in Uganda: Education Attainment and Women's Access to and Land Ownership in Bunyoro Sub-region. *IDOSR JOURNAL OF ARTS AND MANAGEMENT*, 8(2):1-10.
37. Mulegi Tom and Barongo Kirahora Eleanor Rukundika Francois, Mwaniki Roseann (2023). The effect of Health service interventions on reintegration of ex-combatant children in Haute-Kotto

- Prefecture of the Central African Republic. NEWPORT INTERNATIONAL JOURNAL OF RESEARCH IN EDUCATION (NIJRE). 3(2):108-119.
38. Mulegi Tom and Barongo Kirahora Eleanor Rukundika Francois, Mwaniki Roseann (2023). The influence of the family support interventions on re-integration of ex-combatant children in HauteKotto Prefecture of the Central African Republic (CAR). NEWPORT INTERNATIONAL JOURNAL OF CURRENT RESEARCH IN HUMANITIES AND SOCIAL SCIENCES (NIJCRHSS).3(1):24-34.
  39. Mwaniki Roseanne and Eleanor Kirahora Barongo Tom Mulegi, Ndagire Laila. (2023). A situational analysis of Access to and utilization of sexual and reproductive health services under decentralization in Kampala, Uganda. INOSR HUMANITIES AND SOCIAL SCIENCES. 9(1):31-50.
  40. Mwaniki Roseanne and Eleanor Kirahora Barongo Tom Mulegi, Ndagire Laila (2023). Social, economic and cultural factors that influence access and utilization of sexual and reproductive health services under decentralization In Kampala, Uganda. INOSR HUMANITIES AND SOCIAL SCIENCES. 9(1):15-30.
  41. Barongo Eleanor Kirahora and Tom Mulegi (2023). Empowerment and Participation of Women in Community Development in Lower Local Governments: A Case of Makindye Division, Kampala, Uganda. INOSR ARTS AND HUMANITIES 9(1): 48-61.
  42. Mwaniki Roseanne and Eleanor Kirahora Barongo Tom Mulegi, Ndagire Laila (2023). Assessment of the level of knowledge and awareness of women on sexual and reproductive health services (SRH) under decentralization in Kampala Uganda. INOSR ARTS AND HUMANITIES 9(2): 35-47.
  43. Jovita Nnenna Ugwu, Tom Mulegi, Mbabazi Asiati, Chidinma Esther Eze (2023). Challenges Confronting Community Newspapers in Meeting Aesthetics Standards. IDOSR JOURNAL OF COMMUNICATION AND ENGLISH 8(1): 1-5.
  44. Jovita Nnenna Ugwu, Tom Mulegi, Mbabazi Asiati, Chidinma Esther Eze (2023). Barriers to Women Leadership. IDOSR JOURNAL OF ARTS AND HUMANITIES 9(1): 6-10
  45. Tom Mulegi (2015). Skills and motivation of work performance of health professionals in government regional referral hospitals in Uganda:presented at the Canadian International Conference on Advances in Computer Science, Humanities and Education, April 1-2, 2015, Dubai, UAE.conference paper. <http://hdl.handle.net/20.500.12306/1304>.
  46. Tom Mulegi. (2011). Six mix and work performance of health professionals in Government Regional Referral hospitals in Uganda. Kampala International University.
  47. Tom Mulegi. (2011). Skills and motivation on work performance of health professionals in government regional referral hospitals in Uganda. Kampala International University (KIU). <http://hdl.handle.net/20.500.12306/8350>.
  48. Tom Mulegi (2006). The Role of Community Participation in Improving Social Services to Rural Communities in Uganda: A Case of Decentralized Health Services in Butambala Health Sub-District - Mpigi District. Kampala International University, Masters in Development Administration and Management of Kampala. <http://hdl.handle.net/20.500.12306/9207>.
  49. Olaide Olutola Fagbolu, Azizi Wasike. (2019). [Model for Translation of English Language Noun Phrases to Luganda](#). London Journal of Research in Computer Science and Technology. 19(3), 1-14.
  50. Vincent Kayindu, Zahara Faridah Kiggundu, Azizi Wasike (2023). Religion as a Correlate of Administrative Staff's Adoption of Information and Communication Technology (ICT) In Primary Schools of Bukomansimbi District, Uganda. International Journal of Advance Research and Innovative Ideas in Education. 9(4), 1220 – 1228.
  51. Vincent Kayindu, Zahara Faridah Kiggundu, Azizi Wasike. (2023). Administrative Staff's Age and Their Adoption of Information and Communication Technology (ICT) In Secondary Schools, Kampala District, Uganda. International Journal of Advance Research and Innovative Ideas in Education. 9(4), 1229 – 1235.
  52. Barongo E. K, Busingye J. D., Tom Mulegi, Lubaale G (2023). Gendered Economic Gap In Uganda: Education Attainment and Women's access to, and Land ownership in Bunyoro Sub-Region. Idosr Journal of Arts and Management. 8(2), 1-10.
  53. Eleanor Kirahora Barongo, Tom Mulegi, Mary Tunde Nalubega (2023). Evaluation of the relationship between Job Safety and Employee Productivity in Public and Private Organizations in Kampala, Uganda. IAA Journal Arts and Humanities 10(1), 62-75.



54. Rukundika Francois, Mwaniki Roseann, Tom Mulegi, Eleanor Kirahora Barongo (2023). The effect of Health service interventions on re- integration of ex-combatant children in Haute-Kotto Prefecture of the Central African Republic. *Newport International Journal of Research in Education* 3(2), 108-119.
55. Mary tunde nalubega, tom mulegi, eleanor kirahora barongo. (2023). evaluation of the level of job safety in some selected organizations in kampala, uganda. *Idosr journal of current issues in arts and humanities*. 9(1), 60-73.
56. Robert Mpiira, Patrick Okello. (2020). A Multisectoral Approach To Eradication Of Malnutrition In Vulnerable Groups: A Cluster-Randomized Trial. *Acta Scientific Nutritional Health*. 4(2), 1-7.
57. Sudar Rheina Romadhoni, Tatik Suryani. (2023). [The relationship of workplace spirituality, job characteristics employee engagement, and employee wellbeing](#). *Enrichment: Journal of Management*. 12(6), 4780-4787.
58. Ismail Bello, Asmau Isyaku Dutse, Sophia Kazibwe, Muzaare Gerald. (2022). [Multinational Corporations, Knowledge and Technology Transfer in Nigeria: An examination of Etisalat Telecommunications Engineering Postgraduate Programme \(ETEPP\)](#). *International Journal of Research and Innovation in Social Science*. 6(5), 508-513.
59. Gerald Muzaare. (2017). [Management of Integrated Development Programmes in Ibanda and Kiruhura districts in Western Uganda](#). *NIU Journal of Social Sciences*. 2(2), 7-17.
60. Nakate Sylvia, Muzaare Gerald, Katunguka Aaron, Adam Matiko Charles, Mainrad Haule Lembuka, Samanya John, Mutebe Janet. (2019). [Job Satisfaction and Organizational Citizenship Behavior \(OCB\) in Multinational Telecommunication in Uganda](#). *Journal for Studies in Management and Planning* 5(9), 49-52.
61. Blessing Etukudo Ogunjimi, Aniebiet Inyang Ntui, Uduak Enang, Undie Felicia Nkatv. (2022). [Socio-demographic variables and utilization of ict among members of staff of university libraries in cross-river and akwa-ibom state nigeria](#). *Global Journal of Educational Research*. 21(2), 159-171.
62. Osim Tina Alam, Felicia Nkatv Undie. (2023). Students Industrial Work Experience scheme in enhancing employable skills in Library and Information Science students in Tertiary Institutions in Cross River State, Nigeria. *International Research Journal of Education and Technology*. 5(9), 251-264.
63. Abimbola Labake Agboke, Rose Ezeibe, Felicia Nkat v Undie, Ahiaoma Ibegwam. (2021). The Adoption of Microsoft Excel in Resource Processing (Cataloguing and Classification) Section and Readers' Services (Circulation) Section of University Library ...*International Journal of Research in Library Science (IJRLS)*. 7(2), 54-64.
64. Felicia Nkatv Undie, Rose Ezeibe and Abimbola Labake Agboke. (2020). Computer Literacy Skills and Utilisation of Information Resources in Federal University Libraries by Post-Graduate Students in South-South, Nigeria. *International Journal of Advanced Library and Information Science*. 8(1), 470-478.
65. Franklin Muhereza T. Ukaidi Chris U. A, Ssekajugo Derrick, Ukaidi Evelyn. (2024). Road Merchants and Socio-Economic Development: A Study of Cross River State of Nigeria. *Nigerian Journal of Management Sciences*. 25(1), 319-328.
66. Edwine Atukunda, Owen McOnyango, Deborah Amukowa. (2022). [Mchango wa Mashairi ya Kiganda katika Kuendeleza Muundo wa Ushairi wa Kiswahili Kupitia Ufunzaji na Ujifunzaji](#). 5(1), 171-182.
67. Mugizi, W., Mujuni, B. T., & Dafiewhare, O. A. (2019). Ethical leadership and job performance of teachers in secondary schools in Kyabugimbi Sub-County in Bushenyi District in Southwestern Uganda. *Direct Research Journal of Education and Vocational Studies*, 1(1), 11-22.
68. Mugizi, W., Musinguzi, M. N., & Dafiewhare, O. A. (2019). Human resource career development practices and retention of secondary schools' teachers in Rubabo County, Rukungiri District, Uganda. *Journal of Education Research and Rural Community Development*, 1(2), 18-37.
69. Manyange, M. M. N., Abuga, I. M., & Nyambane, D. O. (2015). Investigating the financial knowledge management in selected Ngo's in Yei County, Republic of South Sudan.
70. Ceaser, J. B., Daniel, O., Innocent, E. E., Akiyode, O. O., Brenda, M. G., & Danson, M. (2019). Youth's Awareness of Climate Change in Nakuru Town, Kenya. *International Journal of Scientific Engineering and Science*, 3(11), 19-24.
71. Mwebesa, E., Sumil, N., Hassan, A. H., & Cephus, D. (2017). Antecedents of statistics anxiety in a higher education system.

<https://rjournals.com/research-in-education/>

72. Bengat, J., Odenyo, M., & Rotich, J. (2015). Organizational change and resistance dilemmas resolution approaches and mechanisms. *International Journal of Economics, Commerce and Management*, 3(2), 1-17.

**CITE AS: Bitalo J. U. (2024). Integrating Artificial Intelligence in Personalized Learning in East Africa. RESEARCH INVENTION JOURNAL OF RESEARCH IN EDUCATION 3(3): 134-143.**