



# Integrating Sustainable Education in Modern Curricula: Challenges, Strategies, and Impacts

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## ABSTRACT

Sustainable education has emerged as a vital component of modern curricula, aiming to integrate ecological, economic, and socio-cultural dimensions into teaching and learning processes. This paper explores the multifaceted nature of sustainable education, emphasizing the need for interdisciplinary and transdisciplinary approaches. It examines the various definitions and understandings of Education for Sustainable Development (ESD), the challenges in its implementation, and the critical role of educational institutions in fostering sustainability literacy. Through a comprehensive review of literature and case studies, this study identifies key trends, thematic strands, and effective practices in sustainable education. The findings highlight the importance of integrating sustainability into curricula to prepare future generations for the complexities of global sustainability challenges and to promote holistic development. The paper concludes with recommendations for educators and policymakers to enhance the effectiveness of sustainable education initiatives.

**Keywords:** Sustainable Education, Sustainability Literacy, Interdisciplinary Learning, Transdisciplinary Knowledge and Ecological Dimensions

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## INTRODUCTION

The concept of sustainability has increasingly been recognized in educational practice and scholarship over the last few decades. Initially, sustainability was often narrowly interpreted as primarily concerned with environmental issues. However, contemporary understandings of sustainable development encompass ecological, economic, and socio-cultural dimensions, emphasizing the need for both interdisciplinary and transdisciplinary knowledge and action. Sustainable education, therefore, aims to integrate these dimensions into curricula, fostering well-informed and responsible citizens capable of addressing complex global challenges. Sustainability is a popular and rarely disputed ideal in both public discourse and education [1-5]. This widespread acceptance has led to a variety of definitions and interpretations of what Education for Sustainable Development (ESD) entails. While ESD aims to yield knowledge, competencies, and attitudes necessary for sustainable development, it also grapples with the dual objectives of changing systems and individuals. Researchers globally are exploring how sustainability concepts and values are understood and practiced in educational settings. As a curriculum goal, sustainable education encompasses a broad range of issues, from climate change and biodiversity loss to social disparity and economic systems [6-8]. These issues align with the triple bottom line concept, integrating ecological, social, and economic perspectives. The integration of these dimensions has influenced institutional and educational practices across various levels of education, leading to the development of courses and programs focused on sustainable development [9, 10].

### Sustainable Education

The concept of sustainability has increasingly been recognized in educational practice and scholarship over the last few decades. In terms of the work done and debates on the concept, the critique towards a narrow comprehension of sustainability as environmental issues only, has been prominent. 'Sustainable Development' is now understood to contain the interactions of ecological, economic, and socio-cultural dimensions [11-13]. The integration of these dimensions has emphasized the need for both interdisciplinary and transdisciplinary forms of knowledge and informed action. The concept of 'sustainability' is a charismatic concept, and sustainability education a rarely disputed ideal. Sustainability

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is very popular not only in public discourse but also in education research and practice. Consequently, this popularity and common call for “sustainable education”, brings a variety of definitions and understandings of what such an “education for sustainable development” (ESD) embraces and can do in terms of yielding knowledge, competencies, and attitudes [14–16]. In addition, to lacking coherence among diverse facets of sustainability, sustainable development is a contested concept in educational platforms and practice owing to the term referencing both ‘changing the system’ and ‘changing individuals. Researchers worldwide therefore seek to understand if and how sustainability concepts and sustainability-connected values are ‘understood’ and ‘practiced’ in schools [17]. As a curriculum goal, sustainable education can be understood as learning that sets out to integrate a range of possibilities around issues concerning ecological, social, political, economic, and ethical aspects in theoretical, practical, and problem-based ways. In terms of content presented to children such educational objectives might thus cover issues concerning climate change, water pollution, loss of biodiversity, recycling, urban densification, human rights, migration processes, social disparity in health, energy, water, income, and power, or food distribution and economic systems. These are all fields or problems in the line of ecological issues, which are believed to be in need of well-informed generations becoming responsible citizens [18–20]. That is to say, there are issues falling in any of the three dimensions of the ‘triple bottom line’ concept. The integration of these three dimensions has later on influenced the institutional and educational practices in several higher education institutions [21]. Quite soon courses, programs, or pedagogical practices were given names coined with ‘education for sustainable development’ – ESD. This study attempts to review and categorize critical issues, trends, and thematic strands of ESD through a comprehensive content analysis of Web of Science (WOS) indexed articles and proceedings published within the decade 2006–2015. Meanwhile, the term ‘sustainability literacy’ indicates a need for awareness and competencies towards the challenges and solutions wanted or needed for a better future in general [22].

Sustainable development involves a new way of understanding society, the land, and the planet, according to the organic model of the living organism. The education of young generations is a crucial developmental factor for identifying the aforementioned objectives. The knowledge of environmental aspects and attention to socio-territorial dynamics must be an essential component in their training course [23]. This formative approach must be understood and experienced at various levels; it is not just a school's mission, but the primary sector of training and social and emotional development. It involves family relationships, the system of practices through which the local community and the territory are organized, general culture, and daily life [24–28]. In the framework of local ecological education, multimedia-supported forms of multiple intelligence acquisition, concerning the imaginative one, are fundamental. The school system must redefine its concept of learning in the educational continuity of the various cycles and look for forms of synthesis between a subject-based and transversal curriculum, according to the model of the spiral curriculum, in terms of both lifelong learning and intergenerational membership [29–32]. Given the complexity of their nature, the United Nations has recognized that Sustainable Development Goals need a global reflection, which can provide an educational approach capable of promoting multifaceted skills in an interconnected way. Therefore, sustainable education, schools, and students are involved in the achievement of the seventeen SDGs to ensure prosperity, defense of life, and environmental protection for the present and future generations [33–36]. Thus, Global Education, in the light of the objectives, guides students to consider the future of humanity, the planet, and its inhabitants, transversally addressing European policies. Particularly, through the stakeholder approach, the role of families, the territory, institutions and managers, and the world of work is crucial. 112 teachers and 311 students were involved in this study to objectify the psychological impact of Global Education and its influence on five of the SDGs. The results provided important indications about the importance of translating the SDGs as other European countries, enabling communication, on various levels, also on the benefits existing, to act and take possession of it in various ways [37–39].

### **The Importance of Sustainable Education**

Sustainable development is the holistic approach to integrating social, economic, and environmental dimensions into future patterns and quality of life. Higher education gives a unique opportunity to influence future decision-makers, as well as organizations' current and future employees. Moreover, universities have vital roles in raising awareness at a wider level and moving actors in society towards a common goal of promoting sustainable economic, social, and environmental development. “In their capacity as a kind of public arena, the universities constantly bear in mind the public interest in examining selected sustainable development issues” 1. The state is responsible for the implementation of actions necessary to create conditions for comprehensive development and the activities that allow the sustainable exploitation of the country's potential [40, 41]. “By the very fact, this article attempts to describe and analyze the legal bases for – and the implications of – educators' adaptation of the various

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levels of curriculum to the concept of sustainable development. This should considerably contribute to a successful promotion of this dimension within the formal educational system. Conclusive evaluations regarding the impact of the incorporation of sustainable eration should also serve as a profound argument for the inclusion of the relevant implementation-related considerations in the materials prepared for teacher training programs.” Sustainable development in education can be achieved through the realization of strategic and didactic goals based on common values. The most important of them is not only to disseminate knowledge about the characteristics, conditions, traces, and developmental directions of human-nature relations considered sustainable but also to identify and transfer cultural patterns and norms (models) of behavior which in the long-term perspective contribute to the creation of a sustainable culture [42-44].

#### **Environmental Benefits**

Shifting educational settings at scale is essential; it is argued that Queensland Education and its curriculum could play a leading role within Australia in the transition to sustainable lifestyles, industries, and organizations, and in managing the human violence and poverty that result from entrenched power imbalances between regions and sectors. The conundrum is that Australians are addicted to mass consumption, which is underpinned by the largest gears in the economy consuming ever more of the finite resources extracted from the Earth, damaging the Earth forever under the 'development' at all costs model shared by the state. Establishing and justifying sustainability science and education is necessarily the business of knowledge and educational policy specialists, to ensure quality in policy, pedagogy, and program, with action and research to transform education and economies. The sustainable education practices presented in this literature review were evaluated against criteria defined by Australian Government policy, [45-47]. Initiatives at several scales to reduce and then reverse the environmental impacts of human activity are discussed to clarify how they intend to expedite the transition to a globally sustainable society- sustainable education in particular. The specific targets of these policies are usefully aligned with the 'transformative' educational paradigm called for by [48] to provide young adult 'citizen cohorts' to serve the sustainable development goals of the United Nations as a matter of priority.

#### **Implementing Sustainable Practices in Educational Institutions**

Participatory Entrustment and the Creation of Inclusive Sustainability Learning Environments: This study provides an analysis of sustainability in vocational education settings from the perspectives of teachers. It focuses on Sweden, and it discusses how vocational education in construction is enacted as a powerful context within which people learn craft skills. The study also illuminates how the teaching work of vocational teachers plays an important part in how sustainability is made apparent—in both content and form—in this setting. The relevance of vocational education is pronounced in constructions of what sustainability knowledge is necessary, and how it should be established and realized. This is important to understand, both about how green transition is envisioned and in understanding how sustainability awareness more generally becomes developed in vocational educational settings [49-51]. Sustainability is one of the core strategies undertaken by educational institutions to maintain long-term growth and impact. Sustainable education focuses on economic, environmental, and social responsibility, it's more and more important to integrate it into various education programs. Interdisciplinary cooperation is essential in realizing sustainability in higher education. Existing literature has provided comprehensive reports for sustainable practices through collaboration between engineering and social sciences institutes [52-54]. This article presents two cases of collaboration between business and art institutes to realize sustainability through interdisciplinary work under motivation based on ecological modernization theory. Experiential learning approaches, including problem-based learning and online learning, are adopted to allow students from different disciplines to co-create solutions for sustainable solutions to two problems community service and product design. With multidisciplinary cooperation, this study explored issues and activities, under convergent theory, going beyond common interdisciplinary intermingling to suggest two ways to sustain interdisciplinary work: by engaging different educational departments and by embracing the concerns, criticisms, and innovation that can emerge from interdisciplinary research between business, arts and design departments, leading towards internal and external thrust towards social innovation for sustained development [55, 56]. This study contributed to popular, but under-examined, disciplinary concentration in sustainability works in higher education through multidisciplinary work among business and arts institutes, and proposed continued interdisciplinary work for sustainable education in strategic practices.

#### **Curriculum Integration**

A (semi-) active teaching method such as LoopBack XB in boundary management has been developed for studying energy systems among the houses of the School of Technology and Society at the Malmö campus of Malmö University. The Sustainable Building concept and projects are connected to the EU's

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Horizon 2020 Project, taking this easy-going approach into courses about climate and sustainable development. The educational objectives of ‘career-ready’ programs in Higher Education are not wholly compatible with fundamental education for Climate, Environment, and Sustainability (CES). The “Tech School” at EES into Multidisciplinary Global Sustainable Systems was established in the autumn of 2013, graduating its first master's in 2019 to ~55% women. However, it is an interdisciplinary career-ready program, it is controversial as a CES-focussed program [57-59]. Curriculum integration approaches have been addressed in two SE and CE curricula at the University of Skövde, leading to the promotion of a research track in green and sustainable SE (GSSE). Some curricula follow the SE guidelines provided by IEEE/ACM [60-64]. Examples of bachelor programs in Computer Science and Game Development and loopback paths at Chalmers are given. Concepts and methods using digital twins and XR have come about in collaboration with a company into a project-oriented subject and discussed within AEA's framework for Game-Based Learning. Outreach extends beyond “ordinary” students to teachers and pupils below, which theme is also linked to Technologies for Development. Sustainability at a higher level means thinking beyond sustainability and the authors therefore, also integrate global climate change scenarios and impacts into some of their ISRCT studies. They conclude to re-direct their misunderstanding about the mitigation of impacts towards necessary transformations of the societies, including dispelling sustainalization myths, digitalization and control of knowledge, and the dictatorship of banking and power [65-70].

### **Measuring the Impact of Sustainable Education**

It is also important to consider that sustainability initiatives often deal with more abstract knowledge about a wide range of topics—not all of which can be translated into easily observable behaviors such as recycling or turning off lights. Our program in Mexico aimed to increase various types of knowledge about sustainability and to promote behavior change, or increase levels of sustainable behaviors among participating students. More specifically, participatory students are expected to register an increase in three types of knowledge: declarative, procedural, and especially subjective knowledge. Of course, more sustainable behaviors are highly desirable. However, we also know that increases in knowledge often do not translate into changes in sustainable actions or behaviors, even when educators believe there are direct links between them. Some early evidence suggests that subjective knowledge is a mediating factor between both declarative and procedural knowledge and sustainable behaviour. It will be interesting to see whether any study could identify a tracking mediator between subjective knowledge and pro-sustainable behavior [71-74]. This should prompt other researchers to look more closely into measuring levels of subjective knowledge and assess its links to behavioral change among students participating in educational initiatives. The evaluation of the impacts of educational interventions on sustainability has attracted some attention from researchers in recent years. The general conclusion seems to suggest that empirical evidence about their effectiveness is still scarce. A recent review of sustainability literacy models, sustainable knowledge, and reporting the impacts of sustainability initiatives concludes that more action research is needed in this area [75, 76].

### **Assessment Strategies**

School education itself nevertheless requires a significant boost to leave a mark on the layers of society. School educational institutions in their everyday practices depend on twelve coordinated subsystems which are the object of the educational practice of the institution. They are the areas of responsibility that address the different areas to guarantee and ensure the educational and formative aspects. The figure of the university professor also faces the blind and deaf university in the framework of the educational reality of the current university. Society and the labor market are demanding, and they are gradually introducing requirements that are conditioned by the need to go out prepared. The labor market every day is more competitive. Therefore, students who are trained at the university must exalt excellence and be different from the rest of the applicants. This situation leads the educational institution to a competition that it has to get into, and it must face it [77-79]. The educational model fostered by the United Nations defines four main components of sustainable development: the environmental, economic, social, and cultural dimensions [80-84]. Currently, many universities and even multilateral institutions have integrated a policy of inclusion of these dimensions into their educational models, the so-called fourth mission. In the present study, to measure the sustainability of this University, we analyzed the social balance, and we developed a tool based on the semiotic system that, with the use of linguistic propagation, allows model structuring from a qualitative context and allows verification with the use of statistical methods of randomness [85-90]. Many corporations worldwide have included their strategies towards integration of social responsibility and sustainability into their processes. Moreover, governmental documents from the United Nations and several international organizations underpin education as an essential strategy in which these social responsibilities are integrated into their missions

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[91-99]. The current state-of-the-art parallel to the approach was analyzed with the XES Balance, to offer a methodology that schools can adopt for measuring their sustainability.

### CONCLUSION

The integration of sustainable education into modern curricula represents a transformative shift in educational methodologies, promoting a holistic approach to learning that encompasses ecological, economic, and socio-cultural dimensions. Sustainable education not only enhances students' understanding of complex global issues but also fosters the development of critical thinking, problem-solving, and responsible citizenship. Despite its widespread acceptance and recognized importance, the implementation of sustainable education faces several challenges. These include varying definitions and understandings of sustainability, the need for comprehensive teacher training, and the integration of sustainability into existing curricula. Addressing these challenges requires concerted efforts from educators, policymakers, and educational institutions to create supportive environments for sustainable learning. The benefits of sustainable education are manifold. It prepares students to navigate and address the multifaceted challenges of the 21st century, promoting sustainable behaviors and decision-making. Future trends in educational technology, such as virtual and augmented reality, hold promise for further enhancing the delivery and impact of sustainable education. In conclusion, sustainable education is essential for fostering a more sustainable future. By overcoming current challenges and leveraging innovative approaches, educators can create enriched learning experiences that prepare students to become proactive contributors to sustainable development. The successful integration of sustainable education into curricula will pave the way for a more informed, engaged, and responsible global citizenry.

### REFERENCES

1. Lalchandani, K. N., Crabb, S., Miller, C., & Hume, C. (2021). Content analysis of school websites: policies and programs to support healthy eating and the environment. [ncbi.nlm.nih.gov](https://pubmed.ncbi.nlm.nih.gov/)
2. Jovita Nnenna Ugwu, Asiat Mbabazi, Tom Mulegi, Chidinma Esther Eze, Jude Uchechukwu Aleke, Rachel Okwaja Puche, Eric Mabonga. Effect of Cultural Values on Character Formation: Implication for Education NEWPORT INTERNATIONAL JOURNAL OF EDUCATION RESEARCH. 2023 3(3), 1-5.
3. 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.
4. Karjanto, N. (2023). Mathematical modeling for sustainability: How can it promote sustainable learning in mathematics education?. [\[PDF\]](#)
5. Boffi, M., Rainisio, N., & Inghilleri, P. (2022). The Psychological Impact of Global Education Approach to SDGs. A Study on Emotions and Sustainability Attitudes of European Teachers. [ncbi.nlm.nih.gov](https://pubmed.ncbi.nlm.nih.gov/)
6. Huang, R. (2023). A corpus-assisted discourse study of Chinese university students' perceptions of sustainability. [ncbi.nlm.nih.gov](https://pubmed.ncbi.nlm.nih.gov/)
7. Volkova, M., Stoffers, J., & Kochetkov, D. (2019). Education Projects for Sustainable Development: Evidence from Ural Federal University. [\[PDF\]](#)
8. Torre, D., Procaccianti, G., Fucci, D., Lutovac, S., & Scanniello, G. (2017). On the Presence of Green and Sustainable Software Engineering in Higher Education Curricula. [\[PDF\]](#)
9. 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.
10. Mwebesa, E., Sumil, N., Hassan, A. H., & Cephus, D. (2017). Antecedents of statistics anxiety in a higher education system.
11. 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.
12. 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.
13. 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.
14. Jovita Nnenna Ugwu, Asiat Mbabazi, Tom Mulegi, Chidinma Esther Eze, Jude Uchechukwu Aleke, Rachel Okwaja Puche, Eric Mabonga. Evaluation of Factors that Affect Teachers' Job

- Satisfaction and the Impact on Student Academic Performances NEWPORT INTERNATIONAL JOURNAL OF RESEARCH IN EDUCATION 2023. 3(3), 6-9.
15. P.A & Ashong M Betiang. Adult Education: a remedy for the mis-educated and dysfunctional Nigerian. Niger Delta Journal of Education. 2013 1(1), 263-270.
  16. Peter Betiang. Adult Education and Empowerment of Rural Women in Bette Communities of Cross River State. International Journal of Research in Education. 2011, 3(5), 109-113.
  17. E I Betiang, P.A & Ibiang. Community Education and Community Development in Nigeria. Journal of Educational Innovators. 2010, 8(2), 88-92.
  18. Asanairi Bwambale, Tom Mulegi, Samanya Bulhan. 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. 2024, 10(1), 17-22.
  19. P.A & Ashipu B Betiang. Adult Education for poverty reduction and sustainable development: applying the political economy analysis from the systems theory perspective. International Journal of Research and Administration. 2010, 5(9), 58-73.
  20. Peter Nsiimire Mwesigye, Patrick Mbyemeire, Raphael Kombi. [Academic Performance of Learners by Education Level of Parents in Primary Schools in Ibanda Municipality](#). INOSR Arts and Management. 2022, 8(1), 27-34.
  21. Peters K., A., Capilla, R., C. Coroamã, V., Heldal, R., Lago, P., Leifler, O., Moreira, A., P. Fernandes, J., Penzenstadler, B., Porras, J., & C. Venters, C. (2023). Sustainability in Computing Education: A Systematic Literature Review. [\[PDF\]](#)
  22. American Journal of Academic Research. [Leadership practices and productivity of academic staff in polytechnics in Nigeria](#). American Journal of Academic Research. 2016, (1)2 56-67.
  23. A Mugenyi, I Anumaka, S Gait. [Entry qualifications and teacher trainees' competencies in primary teachers' colleges of Wakiso and Kampala Districts, Uganda](#). American Journal of Academic Research. 2017, 2 A31-A45.
  24. Asanairi Bwambale, Tom Mulegi, Samanya Bulhan. 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. 2024, 10(1), 23-28.
  25. Bulhan Samanya, Seezi Kusemererwa. English language and Academic Performance among Learners in Inclusive Schools of Mabaale Sub County, Kagadi District. NEWPORT INTERNATIONAL JOURNAL OF RESEARCH IN EDUCATION (NIJRE) 2023, 3(2), 81-90.
  26. Ambrose Beluaye Anashie, Veronica Kulo. [Conflict resolution strategies of Nigerian secondary schools' administrators for peace and economic development](#). African Education Indices. 2014, 7(1), 1-12.
  27. Ambrose Beluaye Anashie, Erasmus Eyang Ebuta, Linus Adie. [Influence of students' population pressure and class size on the academic performance of secondary school students in Cross River State](#). Multidisciplinary Journal of Research Development. 2014, 22(1), 1-17.
  28. Ambrose Beluaye Anashie, Patricia Nguwasen Mando. [INFLUENCE OF SCHOOL SUPERVISION ON TEACHER-EFFECTIVENESS IN PRIMARY SCHOOLS](#). Journal of Teacher Perspective. 2014, 8(1).
  29. Ambrose Beluaye Anashie, Mark Terlumun Ijov. [management of primary education for transformation and Sustainable Development in Ogoja Education zone of Cross River State, Nigeria](#). Knowledge Review. 2015, 33(2), 67-75.
  30. Benson Tukundane, Muhammad Kibuuka, Arthur Sunday (2020). [New Product Development Practices and the Growth of Small and Medium Enterprises in Kampala Metropolitan, Uganda](#). International Journal of Research and Innovation in Social Science. 4(4), 266-271.
  31. Abura Samuel Pirir, Ongodia Ekomolot, Kiweewa Emmanuel, Tukundane Benson (2022). [Assessment of Recruitment Methods and Employees Performance in local Governments, Karamoja Sub Region, Uganda](#). International Journal of Research and Innovation in Social Science. 6(7), 410-427.
  32. Ricoy, M. C. & Sánchez-Martínez, C. (2022). Raising Ecological Awareness and Digital Literacy in Primary School Children through Gamification. [ncbi.nlm.nih.gov](https://ncbi.nlm.nih.gov)
  33. Tukundane Benson, Emuron Lydia (2023). [The Role Played by Research and Development in Uganda's MSME toward Promoting SDGs](#). Springer Nature Singapore. 155-173.
  34. Mbyemeire Patrick, Deusdedit Byabashaija, Tumwesigye Mathias, Muhindo Tadeo, Beyongyera Julius, Nyabuhuzi M Donatien. (2016). [Human Resource Planning and Employee Performance in](#)

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

- [Rwanda: A Perspective of Peoples Bank of Rwanda](#). Scholars Journal of Economics, Business and Management. 3(6), 316-320.
35. CALVINE CHEPLETING SEREM, TOM ONGESA. (2023). [Opportunity for advancement strategy on performance of non-academic staff in the university of Eldoret, Kenya](#). Reviewed Journal International of Business Management. 4(1), 516-529.
  36. Omweri, F. S., Muna, W., & Njoroge. (2023). [EFFECTS OF PROBLEM STREAM ON IMPLEMENTATION OF ROAD SAFETY POLICY MEASURES IN NYANZA REGION, KENYA](#). The Strategic Journal of Business & Change Management. 10(1), 269-285.
  37. Fred Omweri Siambe Dr. Thomas Otieno Juma. (2022). Bureaucratic Corruption on Devolved Units on Hard - Core Infrastructural Service Delivery: Case of Lake Region Economic Block, Kenya. American Based Research Journal. 11(5), 01-26.
  38. Thomas Gisemba Onsarigo, Gladys Nyaburi Ogaro. (2015). [Gender based violence: An examination of ITS effect on women's social economic status a survey of Langas estate, Uasin Gishu County](#). International Journal of Advanced Research in Management and Social Sciences. 4(4), 281-290.
  39. Kobusinge Aida. (2023). The Effect of Risk Management on Financial Performance in Centenary Bank Masindi Branch. EURASIAN EXPERIMENT JOURNAL OF HUMANITIES AND SOCIAL SCIENCES (EEJHSS). 4(1), 17-25.
  40. Tukundane Benson, Kibuuka Muhammad, Sunday Arthur (2020). Information Technology Adoption and Growth of Small and Medium Enterprises in Greater Kampala Metropolitan Area, Uganda. International Journal of Advanced Research and Publications. 4(4), 69-74.
  41. Joseph Ekpang, Godwin Omelagah. (2018). Advertising and the Culture of Consumerism in Nigeria: An Analysis of the "Black Friday" Sales of SPAR Nigeria. Journal of Humanities, Management, and Social Sciences, 1(1), 36-52.
  42. Nyambane, D. O., & Ouma, B. O. (2017). Cash Management and Profitability of cement Industries in Kenya.
  43. Byabashaija, D., Aluonzi, B., Karoro, E. A., Manyage, M. N., Nyambane, D. O., & Besigye, O. (2015). Group Formation Criteria of Money lending Associations in Rubirizi District, Western. Uganda.
  44. FRED SIAMBE OMWERI, WILSON MUNA, JANE NJOROGE. (2023). [An analysis of how politics stream affects the implementation of road safety policy measures in Nyanza Region, Kenya](#). Reviewed Journal International of Business Management. 4(1), 13-21.
  45. DUSHIMIMANA GERARD (2016). [Agricultural support projects and coffee production in rwanda: a case study of price project in huye district](#).
  46. Hannington, T., Asuman, B., & Mary, B. (2022). Loans and women involvement in business in Kasese District: A Case of Women Entrepreneurs in Hima Town Council. *INOSR Humanities and Social Sciences*, 8(1), 11-18.
  47. Mbyemeire Patrick, Deusdedit Byabashaija, Tumwesigye Mathias, Muhindo Tadeo, Beyongyera Julius, Nyabuhuzi M Donatien. [Human Resource Planning and Employee Performance in Rwanda: A Perspective of Peoples Bank of Rwanda](#). Scholars Journal of Economics, Business and Management. 2016, 3(6), 316-320.
  48. Fred Ssemugenyi, Augustine Amboka Asumwa, Sophia Kazibwe. [Balancing the delicate space between organizational culture and customer service quality: An empirical review for systemic excellence in the electrical energy sector in Kenya](#). Asian Research Journal of Arts & Social Sciences. 2020, 10(4), 20-32.
  49. Kibuuka Muhammad, Novembrieta Sumil, Byamukama Eliab Mpora, Sophia Kazibwe, Manuel Sumil, Fred Ssemugenyi, Tindyebwa Wilberforce. [Managerial skills and success of small-scale entrepreneurs in Kampala Uganda](#). Canadian International Journal of Social Science and Education. 2015, 3, 546-552.
  50. Enoch Oluwatomio Oladunmoye. [A regression analysis of perceived organizational support, interpersonal relationship and employee turnover intention in southwest Nigeria](#). International Journal of Information, Business and Management. 2017, 9(3), 147.
  51. Oladunmoye E. O, A Rasaq Toyin, Adegunle SO, Chibuzor E ONYEMA. Mediation analysis of Pre-Marital Sexual behaviour in Nigeria: The direct and indirect effects of peer pressure, socioeconomic status, and parent-child relationship. International Journal of Humanities Social Science and Management. 2022, 2(4), 140-148.

52. Bulhan Samanya, Seezi Kusemererwa. English language and Academic Performance among Learners in Inclusive Schools of Mabaale Sub County, Kagadi District. NEWPORT INTERNATIONAL JOURNAL OF RESEARCH IN EDUCATION (NIJRE) 2023, 3(2), 81-90.
53. Samanya Bulhan, Nagaruka Deborah. Non-monetary incentives and employee relations in homes of hope non-government organisation (Mbarara district) IDOSR JOURNAL OF ARTS AND MANAGEMENT. 2023, 8(2), 22-30.
54. Emurugat Immaculate Azabo, Sofia Sol Gaitte, Blessing Ijeoma Anumaka, Yakubu Ibrahim Wunti. [Remuneration and discipline of employees in private universities in Uganda](#). Advances in Social Sciences Research Journal. 2020, 7(1), 438-451.
55. Kukundakwe Rosen, Samanya Bulhan. Decentralization and service delivery in government aided primary schools of Buremba Sub-County. IAA Journal of Management. 2023, 10(1), 78-88.
56. Kusingiza Christine, Samanya Bulhan. Women's Participation and Management of Primary Schools in Ibare Sub-County: Bushenyi District, Uganda. IAA JOURNAL OF SOCIAL SCIENCES. 2023, 9(1), 55-61.
57. Samanya Bulhan, Beyogyera Naboth. Record keeping and operational accountability in Mutara sub-county Mitooma district, Western Uganda. IDOSR JOURNAL OF ARTS AND HUMANITIES. 2023, 9(1), 55-61.
58. Bulhan Samanya, Tom Mulegi, Ramadhan Badru Malinga, Hussein Muhaise, Wallen Atwijukire. Examining the Influence of Regulatory Governance on Service Quality in Bwera District Hospital, Kasese District, Western Uganda. IAA Journal of Management. 2023, 10(2), 17-31.
59. Bulhan Samanya, Umurungi Musiime Florence. Quality management system in Corporate business: A case study of a Customer focus approach in Kimironko Sector-Gasabo District. NEWPORT INTERNATIONAL JOURNAL OF RESEARCH IN EDUCATION. 2023, 3(2), 23-37.
60. Bulhan Samanya, Elias Amana. Evaluation of Youth Empowerment and Community Development: A Case Study of Kamunganguzi Sub County, Kabale District, Uganda. IDOSR JOURNAL OF ARTS AND MANAGEMENT. 2023, 8(2), 11-21.
61. August, E. S. & Tsaima, A. (2021). Artificial Intelligence and Machine Learning: An Instructor's Exoskeleton in the Future of Education. [ncbi.nlm.nih.gov](https://ncbi.nlm.nih.gov)
62. Baillifard, A., Gabella, M., Banta Lavenex, P., & S. Martarelli, C. (2023). Implementing Learning Principles with a Personal AI Tutor: A Case Study. [\[PDF\]](#)
63. Chen, S. Y. & Chien, W. C. (2022). Immersive Virtual Reality Serious Games With DL-Assisted Learning in High-Rise Fire Evacuation on Fire Safety Training and Research. [ncbi.nlm.nih.gov](https://ncbi.nlm.nih.gov)
64. Chen, Z. (2022). Artificial Intelligence-Virtual Trainer: Innovative Didactics Aimed at Personalized Training Needs. [ncbi.nlm.nih.gov](https://ncbi.nlm.nih.gov)
65. Bulhan Samanya, Tom Mulegi, Ramadhan Badru Malinga, Hussein Muhaise, Wallen Atwijukire. Exploring the Impact of Decentralization on Service Quality at Bwera District Local Government Hospital in Kasese District. IAA Journal of Management. 2023, 10(2), 1-16.
66. Karpouzis, K., Pantazatos, D., Taouki, J., & Meli, K. (2024). Tailoring Education with GenAI: A New Horizon in Lesson Planning. [\[PDF\]](#)
67. Kshirsagar, R. P., B. V. Jagannadham, D., Alqahtani, H., Noorulhasan Naveed, Q., Islam, S., Thangamani, M., & Dejene, M. (2022). Human Intelligence Analysis through Perception of AI in Teaching and Learning. [ncbi.nlm.nih.gov](https://ncbi.nlm.nih.gov)
68. Kenwright, B. (2023). Exploring the Power of Creative AI Tools and Game-Based Methodologies for Interactive Web-Based Programming. [\[PDF\]](#)
69. Dimitriadou, E. & Lanitis, A. (2023). A critical evaluation, challenges, and future perspectives of using artificial intelligence and emerging technologies in smart classrooms. [ncbi.nlm.nih.gov](https://ncbi.nlm.nih.gov)
70. Gaskins, N. (2022). Interrogating Algorithmic Bias: From Speculative Fiction to Liberatory Design. [ncbi.nlm.nih.gov](https://ncbi.nlm.nih.gov)
71. Ali Chaudhry, M. & Kazim, E. (2022). Artificial Intelligence in Education (AIEd): a high-level academic and industry note 2021. [ncbi.nlm.nih.gov](https://ncbi.nlm.nih.gov)
72. Hu, A. (2024). Developing an AI-Based Psychometric System for Assessing Learning Difficulties and Adaptive System to Overcome: A Qualitative and Conceptual Framework. [\[PDF\]](#)
73. 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



74. Tom Mulegi.(2022). An Overview of Performance of Health Workers in Uganda. IDOSR JOURNAL OF HUMANITIES AND SOCIAL SCIENCES 7(1): 113-124.
75. Kamalov, F., Santandreu Calong, D., & Gurrib, I. (2023). New Era of Artificial Intelligence in Education: Towards a Sustainable Multifaceted Revolution. [PDF]
76. Jovita Nnenna Ugwu, Tom Mulegi, Mbabazi Asiati, Chidinma Esther Eze . (2023). Prospects and Challenges of Sustainable Development in Africa. IDOSR JOURNAL OF COMMUNICATION AND ENGLISH. 8(1). 6-12.
77. 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.
78. 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.
79. 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
80. 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.
81. 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.
82. 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.
83. 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
84. 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.
85. 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.
86. 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.
87. 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.
88. 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.
89. 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

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

- decentralization in Kampala, Uganda. INOSR HUMANITIES AND SOCIAL SCIENCES. 9(1):31-50.
90. 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.
  91. 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
  92. 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
  93. 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.
  94. 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
  95. 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>.
  96. Dawodu, A., Dai, H., Zou, T., Zhou, H., Lian, W., Oladejo, J., & Osebor, F. (2022). Campus sustainability research: indicators and dimensions to consider for the design and assessment of a sustainable campus. [ncbi.nlm.nih.gov](https://ncbi.nlm.nih.gov)
  97. Redman, A. (2016). Is subjective knowledge the key to fostering Sustainable behavior? Mixed evidence from an education intervention in Mexico.. [osf.io](https://osf.io)
  98. Qi, S., Huang, D., Ma, Q., & Zhou, M. (2023). Factors Influencing Sustainable Development Literacy among Engineering Undergraduates in China: Based on the College Impact Model. [ncbi.nlm.nih.gov](https://ncbi.nlm.nih.gov)
  99. Ramautar, V. & España, S. (2022). Domain Analysis of Ethical, Social and Environmental Accounting Methods. [\[PDF\]](#)

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