

# Information Communication Technologies and Implementation of Education for Sustainable Development in Higher Education in Uganda: A case of Busitema University

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## Abstract

Information and Communications Technologies (ICTs) play an important role in Education for Sustainable Development (ESD), one of the multiple approaches advanced in the last two decades to address the global sustainability crisis. The role of higher education, especially as a main driver of change, in ameliorating the immense sustainability challenges is widely acknowledged. Educators in higher education institutions must strategically engage in profound transformative programmatic, pedagogical and organisational shifts in order to play this role. ICTs are important in enabling educators to make the necessary modifications to effectively promote themes, skills, knowledge, values and attitudes in learners that will foster sustainable development. This study adopted a concurrent mixed strategy to investigate the use of ICT in the implementation of ESD practices by academic staff of Busitema University in Uganda. It sought to find out the dominant ICT activities that staff used for implementing particular ESD practices. The sample consisted of 134 academic staff and students selected using simple random and purposive sampling. The study employed a questionnaire, interview and focus group guides as primary data collection instruments. The results point to a low level of ICT use, with the dominant ICT activities being of communication and sharing

information, information creation and management, which did not add much value to the educational experiences of the learners in ESD. The study recommends staff training in ICT skills to address the challenge that comes with the use of new digital technologies, addressing the issues of access to ICTs and internet infrastructure.

**Keywords:** *Information and Communications Technologies (ICTs); Sustainable development; Education for Sustainable Development (ESD); Higher education*

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## Introduction

The world grapples with immense sustainability challenges of social, economic and environmental dimensions. Scientists have blamed the crisis largely on unsustainable patterns of consumption and production; and lack of sustainable basic education (Li et al., 2019). Many approaches have been suggested for addressing the global crisis. At the centre of the approaches is the need for a shift of consciousness through education, termed Education for Sustainable Development (ESD), which has been advanced in the last two decades. All forms and all levels of education have important roles. However, the role of higher education, especially as main drivers of change in addressing the immense sustainability challenges plaguing the world, is widely acknowledged. Educators in higher education institutions must strategically engage in profound transformative programmatic, pedagogical and organisational shifts in order to play this role. Thus, ESD requires that educators modify existing pedagogical methods to maximise their effectiveness in promoting critical consciousness, and they can achieve this by making use of ICT (Makrakis, 2014). ICTs have become a major driving force shaping educational change and have an important role in achieving the UN's Agenda 2030.

According to Adarkwah (2021), ICTs are a means to achieve SDG 4 and a platform for communication of the SDGs. They are important in enabling educators to make the necessary modifications to effectively promote themes, skills, knowledge, values and attitudes in learners that will foster sustainable development. There is agreement that ICTs, especially digital ones, are essential in facilitating practices of ESD and enabling education to exploit its transformative potential for sustainable development. When combined with existing pedagogies and social contexts, ICTs, especially digital technologies, can constitute strong drivers of transformation of learners' behaviours for sustainability. Thus, planning with technologies is an essential part of a whole system approach to the integration of ESD into practices of higher education institutions (Moody & Adu, 2017).

## ■ Literature Review

Both old and new technologies are essential to the implementation of ESD. Research reveals that educators use ICTs as an innovative interactive tool to achieve different goals of ESD. ICTs provide great interactive tools for the benefit of ESD (Madani et al., 2017). Thus, the use of technology in ESD provides innovative approaches to teaching and learning sustainability, which interests the learners in the practice (Li et al., 2019). It also increases access to information and promotes new ways of interaction, thus acting as drivers of new pedagogical approaches (Meenashki, 2013). Meenashki further reveals that educators believed ICTs could be used to enhance learning and achievement among learners. ICTs are also used to support other pedagogical approaches for sustainability education. Waluyo (2019) reports the facilitative role of ICTs as a pedagogical support during teaching and learning and in helping to improve learners' achievement. He concluded that ICTs create an

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## Declaration

We declare no conflict of interest.

## ■ Availability of data and material for data transparency

All data generated or analysed during this study are included in this published article. The original datasets are available from the corresponding author on reasonable request.

## References

- Adarkwah A. M. (2021). "I'm not against online teaching, but what about us?" ICT in Ghana post Covid-19. *Education and Information Technologies*, 26, 1665–1685.
- Albareda-Tiana, S., García-González, E., Jiménez-Fontana, R., & Solís-Espallargas, C. (2019). Implementing pedagogical approaches for ESD in initial teacher training at Spanish universities. *Sustainability* 11(18). <https://doi.org/10.3390/su11184027>
- Arpita, C., Manvendra, P.S., & Mousumi, R. (2018). Green curriculum analysis in technological education. *International Journal of Progressive Education*, 14 (1), 122–129. <https://doi.org/10.29329/ijpe.2018.129.9>
- Bakkabulindi, K.E.F. (2012). Does use of ICT relate with the way it is perceived? Evidence from Makerere. *International Journal of Computing and ICT Research*, 6(2), 75–94.
- Busitema University (2014). *Busitema University Strategic Plan 2014/2015 – 2017/2018*.
- Dannenberg, S., & Grapentin, T. (2016). Education for sustainable development – learning for transformation. The example of Germany. *Journal of Futures Studies*, 20(3) 7–20.
- Estable, M. (2011). Technology and sustainable development: How online tools can educate. *ISSP Insight*.
- Ferrari, A. (2012). *Digital competence in practice: An analysis of frameworks*. JRC Reports. European Union.
- Haji, S. A. Moluayonge, G. E., & Park, I. (2017). Teachers' use of information and communications technology in education: Cameroon secondary schools perspectives. *The Turkish Online Journal of Educational Technology*, 16(3), 147–153.
- Hong, J. E. (2016). Social studies teachers' views of ICT integration. *RIGEO*, 6 (1), 32–48.
- Kedzierska, B., Magenheimer, J., Kedzierska, A. & Fischbach, R. (2013). The application and impact of ICT in education for sustainable development. *World Conference on Computer Education*. July 2–5. Torun, Poland.
- Li, S., Yamaguchi, S., Shukbaatar, J., & Takada, J. (2019). The influence of teachers' professional development activities on the factors promoting ICT integration in primary schools in Mongolia. *Educ. Sci.*, 9, 78. <https://doi.org/10.3390/educsci9020078>
- Luyombya, D. (2010). Towards effective public digital records management (Doctoral dissertation, PhD thesis. London: University of London). <http://eprints.ucl.ac.uk/19354/1/19354>
- Madani, K., Pierce, T. W., & Mirchi, A. (2017). Serious games on environmental management. *Sustainable Cities and Society*, 29, 1–11.

- Makrakis, V. (2014). ICTs as transformative enabling tools in education for sustainable development. In R. Huang, Kinshuk & J.K. Price (Eds.), *ICT in education in global context: Emerging trends report 2013–2014* (pp. 100–118). <https://www.researchgate.net/publication/300398153>
- Makrakis, V., & Kostoulas-Makrakis, N. (2012). Course curricular design and development of the M.Sc. programme in the field of ICT in education for sustainable development. *Journal of Teacher Education for Sustainability*, 14 (2), 5–40.
- Meenashki (2013). Importance of ICT in education. *IOSR Journal of Research and Methods in Education (IOSR-JRME)*, 1(4), 3–8.
- Messina, L., & Tabone, S. (2012). Integrating technology into instructional practices focusing on teacher knowledge. *Procedia-Social and Behavioral Sciences*, 46, 1015–1027.
- Moodly, L.A., & Adu, O. E. (2017). Information and communication technology (ICT) in education for sustainable development (ESD): Quality teaching and learning outcomes. *Journal of Communication*, 5(2), 197–202. <https://doi.org/10.1080/0976691X.2014.1188483>.
- Muianga, X. (2019). *The role of ICT in the shift towards student-centered learning in higher education: Eduardo Mondlane University, Mozambique: A case study*. Stockholm University.
- Müller, U., Hancock, D.R., Stricker, T., Wang, C. (2021). Implementing ESD in schools: Perspectives of principals in Germany, Macau and the USA. *Sustainability*, 13(17), 9823. <https://doi.org/10.3390/su13179823>
- Nomura, K., & Abe, O. (2010). Higher education for sustainable development in Japan: Policy and progress. *International Journal of Sustainability in Higher Education*, 11(2), 120–129.
- Opati, D. O. (2013). *The use of ICT in teaching and learning at Makerere University: The case of College of Education and External Studies*. Masters dissertation. <http://www.duo.uho.no/>
- Percy, W.H., Kostere, K., & Kostere, S. (2015). Generic qualitative research in psychology. *The Qualitative Report* 20 (2)5, 766–85.
- Rana K., & Rana K., (2020). ICT integration and learning activities higher education: A case study of Nepal's teacher education. *Malaysian Online Journal of Educational Technology*, 8(1), 36–47.
- Rana K (2018). *ICT in rural primary schools in Nepal: Context and teachers' experiences*. (Thesis). University of Canterbury, New Zealand. <https://ir.canterbury.ac.nz/handle/10092/457>.
- UNESCO. (2014). *Roadmap for implementing the Global Action Programme on Education for Sustainable Development*. UNESCO.
- UNESCO. (2018). *Integrating Education for sustainable development (ESD) in teacher education in South-East Asia: A guide for teacher educators*. UNESCO.
- Waluyo, B. (2019). The effects of ICT on achievement: Criticizing the exclusion of ICT from World Bank's education sector strategy 2020. *Malaysian Online Journal of Educational Technology*, 7(2), 71–87. <https://doi.org/10.17220/mojet.2019.02.005>.
- World Commission on Environment and Development [WCED] (1987). *Our Common Future*. Oxford University Press. <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>
- Yiu, S. (2015). *Education for sustainable development in liberal studies: Perceptions from teachers in Hong Kong*. The HKU Scholars Hub.