INTERNATIONAL JOURNAL OF LATEST TECHNOLOGY IN ENGINEERING, MANAGEMENT & APPLIED SCIENCE (IJLTEMAS)

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XVI, Issue I, January 2025

Digital Initiatives in Education: The Impact of Information and Communication Technology (ICT) Use in Classroom-Based Teaching and Learning within the Education 5.0 Mantra

[1]Eusebius Pio, [2]Charity Caroline Chadzimura, [3]Rutendo Selina Badza

[1]Student University of Zimbabwe

[2,3]Lecturer University of Zimbabwe

DOI : https://doi.org/10.51583/IJLTEMAS.2025.1401032

Received: 24 January 2025; Accepted: 04 February 2025; Published: 18 February 2025

Abstract: The 21st Century demands have brought a positive wave in the classroom through the coming in of the digital initiatives. This paper investigates the role of digital initiatives in education, concentrating on how Information and Communication Technology (ICT) influences classroom teaching and learning within the context of Education 5.0. As the educational landscape changes, the integration of ICT has become essential for improving teaching practices and engaging learners. This research looks into how ICT tools enable interactive learning environments, support collaborative learning, and offer access to a wide range of educational resources. Furthermore, it underscores the obstacles educators encounter when trying to incorporate these technologies and emphasizes the necessity for professional development to successfully integrate ICT into educational programs. By utilizing both qualitative and quantitative analysis, this study seeks to shed light on the transformative capabilities of ICT in creating a more dynamic and inclusive educational experience, ultimately aiding in the achievement of the objectives of Education 5.0.

Key Words: Digital, technology, ICT, Education 5.0

Definition of Keywords

According to Torero (2020) assert that ICT encompasses equipment and services. ICT includes the computing industry (hardware, software, inputs, outputs, networks that's the internet and all related services); electronic data processing and display (such as photocopiers, cash registers, calculators and scanners, as well as myriad of less well known machines specifically tailored to production and manufacturing); telecommunications and related services such as fixed and cellular telephones, facsimile machines, instant messaging, teleconferencing, and so on; and audiovisual equipment and services including television, radio, video, DVDs, digital cameras, compact discs, MP3 players and so on (Ndebele, 2019).

According to Chirume (2020) Education 5.0 is a philosophy which promotes the application of gained knowledge on the local environment to produce goods and services. It focuses on 5 pillars: research, teaching, community service, innovation and industrialization.

I. Introduction

The education landscape is rapidly evolving due to advancements in Information and Communication Technology (ICT). Education 5.0 aims to integrate technology with human needs, aligning learning outcomes with societal and economic demands. ICT enhances teaching methods, student involvement, and promotes critical thinking, creativity, and teamwork. This introduction explores the effects of ICT on education, examining how digital initiatives transform teaching practices, improve accessibility, and prepare students for a digitalized future.

Conceptual Framework

The fusion of Information and Communication Technology (ICT) in education has transfigured teaching and learning practices globally. The Education 5.0 framework, which emphasizes a holistic approach to education with a cultural flavour, seeks to satisfy the needs of the contemporary century by focusing on sustainability, innovation, and the development of skills relevant to modern economies. This framework builds on previous educational models, including education 1.0 (traditional teacher-centred approaches), education 2.0(collaborative and interactive learning), and education 3.0/4.0 (technology-enhanced learning). Initially the Ministry of Education adopted Education 3.0 which was made up of only 3 pillars: Teaching, Research and Community service. The vision 2030 embeds ICT in all national development strategies as an enabling tool for development. The vision 2030 also emphasizes developing a curriculum that speaks to the requirements of the industry emphasizing on Science, Technology, Engineering and Mathematics (STEM) subjects. However, the ministry discovered in-order to achieve vision 2030, knowledge without goods and services is not more important hence the adoption of Education 5.0. The philosophy includes two more pillars: innovation and industrialization. ICT then became an important subject as the

Generally, literature and media observed the difficulties in the utilization of ICT tools in the educational process. Some authors have highlighted that ICT use is not appropriate for rural secondary school learners (Ramirez, 2020). According to Adigun (2021)

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XVI, Issue I, January 2025

rural schools often lack robust ICT infrastructure, including reliable internet connectivity and electricity. For that same reason, the adoption of ICT is burdensome in third world countries, Zimbabwe in particular, which has inadequate technology infrastructure, no ICT integration plans in place, ICT resource scarcity, technical challenges and teacher incompetence (Chiremba, 2024). According to Matevera (2024) more than 14000 computers have been distributed to 719 schools nationwide under the ongoing e-learning program being spearheaded by the second republic. However, the question is, "what are the effects of the use of ICT in the educational process?". Therefore, it is imperative to have a deep understanding of the effects of the application of ICT in educational process in-order to find solutions to reduce the negative effects to complement the efforts made by educational stakeholders in promoting ICT in educational

Theory Underguiding the Study

Connectivism

Connectivism, as developed by George Siemens, posits that learning occurs through the formation of networks and connections facilitated by technology. In the context of Education 5.0, which emphasizes the integration of advanced technologies in education, Connectivism highlights the importance of digital tools in creating learning environments where students can engage with information and each other in meaningful ways. This theory suggests that knowledge is not merely acquired but constructed through interactions within a network of peers, educators, and digital resources (Siemens, 2005).

In Zimbabwe, where educational institutions are increasingly adopting ICT, Connectivism underscores the potential for collaborative learning experiences that transcend traditional classroom boundaries. Students can leverage online platforms to share knowledge, engage in discussions, and access diverse resources, thereby enhancing their learning outcomes.

Diffusion of Innovations Theory

The Diffusion of Innovations Theory, proposed by Everett Rogers, examines how new ideas and technologies spread within a society. This theory is particularly relevant in understanding how ICT tools are adopted in Zimbabwean educational settings. It identifies key factors that influence the adoption process, including the perceived advantages of the innovation, compatibility with existing values and practices, and the complexity of the technology (Rodgers, Singhal, & Quinlan, 2014).

In the context of Education 5.0, this theory can help analyse the barriers and facilitators to ICT adoption in Zimbabwean schools. For instance, understanding how educators perceive the benefits of using ICT in their teaching can inform strategies to promote its integration. Additionally, the theory emphasizes the role of early adopters and opinion leaders in influencing their peers, which can be crucial in fostering a culture of innovation within educational institutions.

Social Learning Theory

Albert Bandura's Social Learning Theory emphasizes the role of observation, imitation, and modelling in the learning process. This theory is particularly relevant in the context of ICT, as digital platforms provide numerous opportunities for learners to observe and learn from others, including peers, educators, and experts (Stafford, 2023)

In Zimbabwe, the use of ICT can facilitate social learning by enabling students to engage in collaborative projects, participate in online discussions, and access a wealth of educational resources. By observing the behaviours and strategies of others in digital environments, learners can enhance their understanding and skills, making Social Learning Theory a vital component of the educational framework.

Integrating the Theories

In conclusion the integration of Connectivism, Diffusion of Innovations, and Social Learning Theory provides a comprehensive framework for understanding the effects of ICT in Education 5.0 in Zimbabwe.

- **Connectivism** emphasizes the importance of networks and collaborative learning, highlighting how ICT can facilitate connections among learners and resources.
- **Diffusion of Innovations** offers insights into the adoption process of ICT, helping to identify factors that influence its integration into educational practices.
- **Social Learning Theory** underscores the significance of observational learning in digital environments, illustrating how students can benefit from engaging with peers and experts online.

Together, these theories inform educational policies and practices aimed at enhancing the use of ICT in Zimbabwean schools, ultimately contributing to improved teaching and learning outcomes in the context of Education 5.0.

II. Literature Review

For the purpose of this study only a few of early writers are summarized and connected to how they impact the use of ICT in schools. In 2009, Van Meter Community School in Iowa adopted a one-to-one laptop initiative in grades 6-12 (Miller&Shannon, 2011). Since the launch of this program, the school has reported that there was an evolving atmosphere of respect, creativity, collaboration, and connection (Suzor, 2022). They also say that independent thinking and learning has prevailed at their school

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XVI, Issue I, January 2025

(Kaseve, 2023). Through this educational transformation, Van Meter has become a place where students can find their passion (Miller, 2019). This shows that ICT has unquestionably impacted the teaching and learning process. These effects show the positive relationship between ICT and Sustainable Development Goal 4 (SDG4). SDG4 is one of the country's goals, which aims at promoting quality education for all (Doorgapersad, 2022). Education is central to the realization of the 2030.

Agenda for Sustainable Development (Gamal, 2022). Within the comprehensive 2030 Agenda for Sustainable Development, education is essentially articulated as a stand-alone goal (SDG4) with its seven (7) outcome targets and three (3) means of implementation. SDG4 aims at ensuring universal and equitable quality education and promoting life-long learning opportunities for all. This can be made possible if educational outcomes have ICT skills (Suarez, 2022). Tailor and Francis (2023) asserts that the positive effects of ICT include increased student motivation; increased student engagement; increased student collaboration; increased hands-on learning opportunities; allows for learning at all levels; increased confidence in students, and increased technology skills. In addition, (Ude Eze, 2021) most students believe that their learning is improved by integrating technology into classroom curriculum. Students participating in the study reported that using technology in school makes learning fun and helps them learn more (McCoy, 2020). They believe to learn by doing, interacting, and discovering (Baytak, 2022). Using technology in classrooms has the potential to create increased student motivation, increased social interactions, positive outcomes, enhanced student learning, and enhanced student engagement (McCoy, 2020).

In (2023) in the teacher magazine of 26 July 2023, UNESCO calls for the smartphone ban in schools. This was because of the increased rate of cyber bullying and other negative effects of the use of ICT tools. Many schools do not allow the use of cell phones during learning hours, and most have strict rules regarding the use of cell phones. In addition, there is a video on social media recently in which parents were forcing their children to destroy cell phones believing that the gadgets were the main cause of poor performance in school. For all efforts to be channelled towards one direction, to leave no one behind and for Zimbabwe to become a middle-class economy by 2030, educational stakeholders should have a deep understanding of the effects of ICT with the aim of developing possible solutions to problems brought by ICTs in schools.

According to (Cotton, 1997), computer-aided instruction produced better achievement effects than traditional instruction alone and the use of computers in teaching also led to positive changes in attitudes towards school and learning in general, as well as in motivation. ICTs are more useful for teachers for collecting teaching-learning resources, preparing and presenting lessons, motivating the students, having more frequent interactions, and providing the students with feedback. ICTs in education can benefit the education system at different levels: increasing access to learning opportunities, enhancing the quality of education with advanced teaching methods, improving learning outcomes and enabling reform or better management of education systems (Pandolfini, 2016). But despite decades of large investments in ICTs and their increased use in all OECD countries, data to support the perceived benefits from ICT are limited and evidence of effective impact is elusive or even debatable (Bocconi, 2013).

While most of the early researchers emphasize the positive effects of ICT, (Onyenani, 2015) in their study of the negative effects of ICT conclude that ICT can take valuable learning time, it can be overused, also it can turn educational experience into games for students and thus enhances low academic performances, as well as exposing students to porn sites and can distract them during class hours. In addition, (Onyenani, 2015) recommend that ICT tools are useful when mature minds operate them, and secondary school authorities should ensure that ICT tools are prohibited in schools. Rahman (2022) asserts that computers limit student's imagination, critical thinking and analytical skills, they simply make plagiarism. He moreover notes that teachers waste most of their time monitoring and controlling learners using ICT. Ghavifekr (2015) noted that lack of adequate ICT equipment and internet access is one of the key challenges that schools specifically in rural areas are facing now and even in schools with computers, the student-computer ratio is high. He also asserts that, in most schools, technical difficulties sought to become a major problem and a source of frustration for students and teachers and cause interruptions in the teaching and learning process. According to (Ghavifekr S, 2014): limited accessibility and network connection, limited technical support, lack of effective training, limited time and lack of teachers' competency are some of the challenges being faced by teachers in implementing ICT in the teaching and learning process.

According to (Cotton, 1997), computer-aided instruction produced better achievement effects than traditional instruction alone and the use of computers in teaching also led to positive changes in attitudes towards school and learning in general, as well as in motivation. ICTs are more useful for teachers for collecting teaching-learning resources, preparing and presenting lessons, motivating the students, having more frequent interactions, and providing the students with feedback. ICTs in education can benefit the education system at different levels: increasing access to learning opportunities, enhancing the quality of education with advanced teaching methods, improving learning outcomes and enabling reform or better management of education systems (Pandolfini, 2016). But despite decades of large investments in ICTs and their increased use in all OECD countries, data to support the perceived benefits from ICT are limited and evidence of effective impact is elusive or even debatable (Bocconi, 2013).

While most of the early researchers emphasize the positive effects of ICT, (Onyenani, 2015) in their study of the negative effects of ICT conclude that ICT can take valuable learning time, it can be overused, also it can turn educational experience into games for students and thus enhances low academic performances, as well as exposing students to porn sites and can distract them during class hours. In addition, (Onyenani, 2015) recommend that ICT tools are useful when mature minds operate them, and

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XVI, Issue I, January 2025

secondary school authorities should ensure that ICT tools are prohibited in schools. According to (Rahman 2022), computers limit student's imagination, critical thinking and analytical skills.Moreover, teachers waste most of their time monitoring and controlling learners using ICT.

III. Research Methodology and Design

This study made use of hybrid interviews and observations as the main primary data sources. This involved the use of open-ended questions which allowed the interviewer and the interviewee to discuss the topic in more detail. Ruslin (2022) states that the semi-structured interview is between the unstructured and structured interview, in which the area of interest is chosen and questions are formulated but the interviewer may modify the format or questions during the interview process.

According to Zikmund (2019) a research design is a master plan which specify the methods and procedures for collecting and analyzing the required information. Before data collection, research needs a structure or a design which guides the researcher to the type of evidence to collect. A research design is a structure which ensure the obtaining of relevant evidence that answers the research questions in a convincing way (Bostley,2019). In this study, the researcher used a qualitative research design. According to (Flick,2022) qualitative research design describes a phenomenon from inside out from the participants' point of views. To get an understanding of a phenomenon, the researcher used open-ended interview guides. Interview guides allowed the respondence to freely give their opinions without forcing them to choose from fixed responses.

A sample of 52 participants was used (38 educators 14 Students), consisting of educators and students. Data gathering was done using the interviews and questionnaires

IV. Data Presentation, Analysis, Discussion and Interpretation

Negative Effects of ICT use in the Teaching and Learning within the Education 5.0

- **Visiting prohibited sites**

Most respondents complained about the learners who visit prohibited sites on the internet. One of the responded sited that,

"Some learners visit unethical sites which shows pornography, and this has negatively affected their behaviour as they will want to experiment what they saw."

This shows that learners on their own may fail to choose better sites for themselves therefore they need monitoring and guidance when using ICT tools.

- **Cyber bullying**

The research shows that most learners are bullying each other on the internet. Posting negative comments about someone is one way of cyber bullying. When the researcher visited one of the schools, he noticed that school authorities were in a disciplinary meeting. After an inquiry, the researcher noted that, one learner's picture labelled,

"*ndinokuita violence inorwadza" (I will mercilessly assault you!),* had gone viral on learner's academic groups.

One of the respondents also noted that,

"*most conflicts among learners starts on the internet."*

- **Internet addiction**

Learners are using ICT at any time they want to without supervision. They end up being anti-social and this is negatively affecting their health. From information from the interviews, learners need to be guided and monitored by an adult when using ICT.

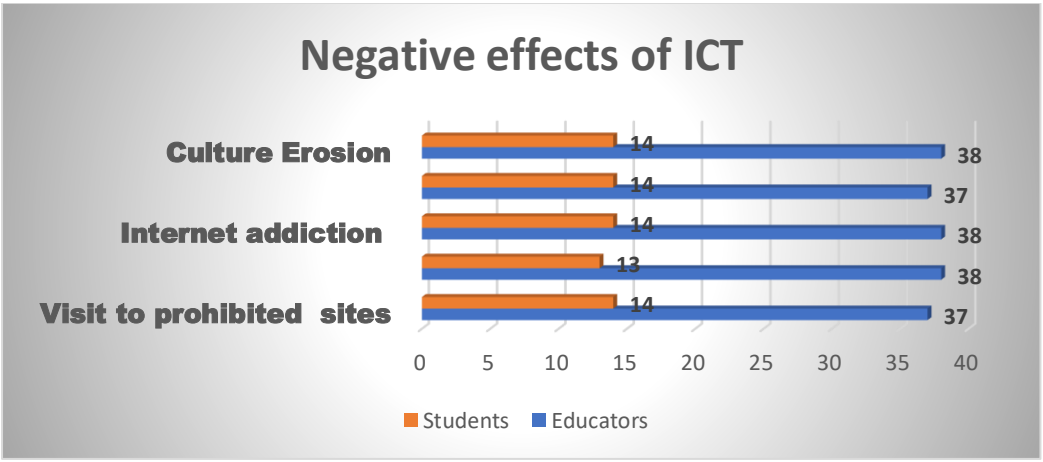

Figure 1 Negative Effects of ICT

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XVI, Issue I, January 2025

Fig 1 above shows the responses from the interviews concerning the effects of ICT in the teaching and learning processes and procedures. It is of high note that on all respondents from the educators, indicated that these effects affect the ICT negatively. The responses relate to the 38 educators interviewed and the 14 students picked for the sample.

Positive Effects of ICT use in the Teaching and Learning within the Education 5.0

● Innovation

The use of ICT has improved both learners and teachers. Innovative ideas in education have increased. Learners are using ICT in a more productive way. This was supported by one of the respondents who said,

"*We are currently working on making a report card for the school."*

This indicates that teachers and learners are becoming more creative and productive. The school has stopped looking for report cards elsewhere but can now rely on the innovation and creativity of their staff members and learners using ICT. This is in support of the education 5.0 which emphasizes innovation and industrialization.

● Improved research and development

ICT in schools has allowed both teachers and learners to engage in research and development. Learners are doing research for their projects from different learning areas. In-order to do CALAs, learners are forced to do research, and this has been made easy by the introduction of ICT in schools. Most teachers are doing online programs with different universities. One of the respondents highlighted that,

"Doing a degree has been made easy with the use of ICT, since teachers attend zoom lectures in the comfort of their homes and only visit the campus during exams."

This will lead to a highly educated society in support of the sustainable development goal number four which emphasizes quality education. An educated society is a pre-requisite for innovation and industrialization.

● Improved academic results

Since the introduction of ICT, academic results have improved. Learners can access academic information on the internet and can learn even in the absence of the teacher. Learners can use their spare time to research or learn from the internet.

This is in support of one of the respondents who noted that,

"Teaching and learning has been made easy by the use of ICT since one can easily use software applications like the meta to find solutions to academic problems."

Teachers are no-longer the only fountain of information; therefore, learning will never stop even during school holidays.

From the interviews, another respondent highlighted that,

"Our learners are scoring thirty points at A 'level and fourteen As at O'level since the introduction of ICT in schools."

Such educational outputs can be very useful in making Zimbabwe a middle-class economy by 2030. Therefore, ICT acts as a catalyst to the education 5.0, that is innovation and industrialization.

Perceptions of Respondents on the use of ICT in Teaching and Learning Within the Education 5.0

Most respondents highlighted that ICT use should continue in schools. However, there is need for close monitoring of learners when using ICT tools and set time limits for learners to use ICT. This will make the use of ICT in the teaching and learning within the education 5.0 a success. This was supported by one of the respondents who highlighted that,

"We cannot do without ICT in the 21st century, only monitoring is required."

Most respondents identified government support as one of the ways of making the adoption of ICT in teaching and learning within the education 5.0 framework a success. This was supported by one of the focus group interview guide respondents who argued that,

"Lack of enough ICT tools is a major challenge and if possible, the government should supplement the shortages."

To curb the problem of power cuts solar power should be used. In support Jaine, a semi-structured interview guide respondents said,

"Solar system is more reliable when using ICT."

During the research at one of the schools, the researcher noticed that only the science laboratories and the administration block were connected and powered by solar system. Due to power cuts, learners were scrambling for a few sockets to charge their gadgets in-order to prepare for their final Zimbabwe Schools Examination Council (ZIMSEC) exams.

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XVI, Issue I, January 2025

Observation results also highlighted similar reasons with points highlighted in the interviews. Except that the Observations brought in the issue of global reach where the students and educators were connecting and showing maximum use of the international conferences and international communication forum as evidenced in the teaching and learning processes observed.

One educator was observed trying to assist students to log into the google meet for an international discussion forum using the ICTs.

The educator clearly said that,

"there is no reason to limit your studies, we can be in any country, anytime."

The flexibility in technology devices also was observed as one of the benefits of ICTs which improves research and development. The educator was observed using the smart input HP desktop in accessing an institution service online. The illustration showed the benefits of maximising ICTs in enhancing research. Using a touchscreen to facilitate input and selecting option on an online form.

Also, through the observations done, it is outstanding to note that the maximum use of the alternative source of power like solar is the best move to enhance the visibility and sustainability of ICT services in schools. The same point was noted through the interview responses.

The observations results were coded into theme as the data was collected as the benefits to students.

Theme 1- Engagement and Motivation

The ICTs increases participation in multimedia lesson which led o high levels of enthusiasm and motivation

Theme 2-Personalised Learning Experiences

The use of adaptive learning technologies in the teaching and learning processes improved learning outcomes through tailed support and made the delivery of complex concepts simpler.

Theme 3- Participatory and Learner centred approach

The use of the ICTs enhanced the interaction during the teaching and learning. Learner centred approach enhanced participation and provoked the execution of problem solving and creativity amongst the peers as they interacted through the group discussions. The table below shows the observation, results and the evaluation of the results as observed in the lessons observed.

Table 1 ICT Observation Evaluations

THEME	OBSERVATION	RESULT	EVALUATION OF OBSERVATION RESULTS
Collaboration and Communication	The use of the ICTs Increased collaboration via digital tools and made the lesson involving and interesting. Assisted the educators in explanations and giving emphasis to concepts	ICTs resulted in a strengthened teamwork skill development and enhanced peer learning opportunities. Students can navigate through the technologies.	The engagement can lead to good results and can change the attitude of learners
Digital Literacy competences	Improved digital skills among students and gives the teacher confidence in lesson delivery and makes the development linked and the lesson flew.	21at century demands the digital skills this is a good initiative so that students confirm to the demands of the community and the industries.	The impact of the digital skills was observed and valued as a critical competence which improves teaching and learning
Educators Professional Development	The demands of the ICT use in teaching and learning demands the educator to keep upskilling and embrace with the changes in the technology wing. Engagement in online professional development	Good ICT use in the teaching and learning can boost confidence and avoid humiliation in front of the students.	Educators need to keep themselves engaged in professional development. The Responsible ministries to also introduce and or facilitate the professional development training programs especially in ICTs so as to keep embracing the upcoming technologies and be able to use the ICTs effectives in teaching and learning.

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XVI, Issue I, January 2025

Critical thinking and Problem Solving	Hands on practical scenarios are encouraged during the teaching and learning. Like the practical example of the Econet devices was the best for the lesson of networking the Educator was delivering. Relate examples to the real-world problems which are currently trending	Having these real scenarios will make learning real and hence improve the critical thinking and decision making in learners.	There is need to instil this to educators in all learning areas that teaching and learning has to be practical so that the learners think outside the box.

Analysis On How Ict Has Improved Teaching And Learning

Availability of research platforms

The availability of research platforms like the AI chatbots, the internet itself and other search engines has extended the pool of information in students and extended the library hours, Students through the digital gadgets can now reach information the fullest.

Collaboration and communication

Online discussion, video conferencing, instant call platforms and the virtual field trips expand student's horizon, thereby providing access to remote and inaccessible data warehouses. The ability to relate to meta data in teaching and learning is a positive move in the use of these ICTs in education. Platforms like google meet, skype among others facilitate inclusive communication amongst peers, educators and experts globally.

Data analysis

The use of specialised software and multiuse software like Microsoft Excel enables educators and students to collect, analyse and interpret data on student performance, informing instructions and improving outcomes.

V. Recommendations

The research presents the following recommendations which can pave way for futures researchers and or contribute to the decision and policy makers for the responsible ministries.

Formulation of an Inclusive ICT Strategy

There is need to develop a comprehensive ICT Strategy with clearly laid down vision and strategic plan for ICT integration that speaks to the educational goals with a close inclusion of stakeholders.

Advocate for a community engagement policy

The school community engagement policy aims to involve all stakeholders, including private organizations, police, health practitioners, and parents, in teaching learners about ICT's role in promoting education 5.0, innovation, and industrialization. This policy aims to create socially responsible citizens who can positively use ICT for innovation and industrialization.

Professional development workshops

A workshop for school staff on ICT tools is being held to improve efficiency and effectiveness in responding to over 1,000 learners' ICT needs, highlighting the need for more skilled manpower in schools.

Digital Huns at provincial or district levels

The plan will cover the digital divide gap and enhance the digital infrastructure for the schools to reach.

Ensure Student centered and collaborate learning

There is need to ensure participatory, collaborative and student-centered learning where they interact at peer level.

Digital Citizenship awareness

Educate the community and the schools on the impact and value of digital literacy to create and have the best digital citizenship culture in the now and next generation.

Funding and scholarship as a motivation factor

Funding of the Heritage Based Curriculum (HBC) for it to be successful. The HBC helps us to return to African Knowledge System (AKS) where learners are taught to make use of the locally available resources designed to produce goods and services to meet local needs and ultimately industrialize. The use of ICT will help learners to be more innovative and creative. The HBC helps educational output to be able to deal with any hindrance that stops them from achieving their goals.

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XVI, Issue I, January 2025

Change of current Policies in schools to accommodate ICT

ICT courses should be compulsory and a requirement in colleges and universities since it is now a requirement in education and also Subsidies ICT use in schools to cater for the less privileged

VI. Conclusions

The integration of Information and Communication Technology (ICT) in education is crucial for achieving Education 5.0 goals. ICT enhances learning experiences by facilitating interactive, personalized learning, fostering collaboration, creativity, and communication. However, challenges like the digital divide must be addressed for equal access. Effective integration requires professional development for educators, enhancing digital literacy. Data-driven insights enable ongoing assessment and refinement of teaching practices, while continuous innovation is essential for adapting to the rapidly evolving educational landscape.

References

1. Adigun, M. M. ((2021)). Academics experience of implementing E-learning in a South African Higher Education Institution. International journal of Higher education.
2. Baytak. (2022). Research in social Science and Technology.
3. Bocconi, S. A. (2013). Overview and analysis of learning initiatives in Europe. Luxembourg :Europe Commission.
4. Bostley. (2019). Basic of research design. Research Gate.
5. Chiremba. (2024). ICT Integration in Rural Primary Schools in Gweru. ResearchGate.
6. Chirume. (2020). Sustainable professional development of primary school mathematics teachers in Zimbabwe through philosophy of education 5.0: challenges and prospects. Sumerianz Journal of Social Science,.
7. Cotton, K. (1997). Computer Assisted instruction. Northwest Regional Educational Laboratory. School Improvement Research Series 9/7/97.
8. Doorgapersad. (2022). The use of digitalisation (ICTs) in achieving sustainable development goals. Global journal of Emerging Market.
9. ERAP. (2023). Put learners first: UNESCO calls for global ban on the use of cellphones in schools. The Guardian.
10. Flick, U. (2022). The SAGE handbook of Qualitative research design. SAGE Publications torrosa.com.
11. Gamal. (2022). Framing the role of higher education in sustainable development. International Journal of sustainability in higher education, 320-355.
12. Ghavifekr S, T. K. (2014). Teaching and Learning with ICT Tools:Issues and Challenges from Teachers' perceptions. Malaysian Online Journal of Educational Technology Volume 4, Issue 2.
13. Ghavifekr, S. &. (2015). Teaching and learning with technology: Effectiveness of ICT integration in schools. International Journal of Research in Education and Science, 175-191.
14. Jansen. (2023). What is research philosophy. GradCoach.
15. Kaseve. (2023). Evaluation of the integration of information and communication technology programme in public secondary schools of Kitui country Kenya. ir.cuea.edu.
16. Matevera. (2024). Government distributes over 14000 computers to schools. Harare: The Herald.
17. McCoy. (2020). How important is technology in education. American University School of Education.
18. Miller&Shannon. (2011). learning and leading with technology. Student voices for change, 2023.
19. Miller. (2019). Digital storytelling 4e. Boca Raton: CRC Press.
20. Nanyanzi, R. (2023). The use Of Information Communication Technology (ICT) and effective teaching and learning: a comparative study of Kyambogo and Makere universities. kyuspace.kyu.ac.ug.
21. Onyenani, M. &. (2015). A study of the negative influences of ICT on secondary school students in Nigeria. American Academic& Scholary Research Conference .
22. Pandolfini, V. (2016). Exploring the impact of ICTs in education .Controversies and challenges. Italian Journal of Sociology of Education,8(Italian Journal of Education 8/2), 28-53.
23. R Ruslin, S. M. (2022). Semi-structured Interview: A methodological reflection on the development of a qualitative research instrument in educational studies. IOSR Journal of Research&Method in Education, 22-29.
24. Rahman. (2022). Usage of ICT in mordern education methods. EuroAsia Journal of Social Sciences.
25. Retrieved from Suzor IT: https://www.suzorit.com
26. Rodgers, E. M., Singhal, A., & Quinlan, M. M. (2014). Diffusion of innovations. In An integrated approach to communication theory and research. Routledge.
27. Siemens, G. (2005). Connectivism: A learning theory for the digital age. International Journal of Instructional Technology and Distance Learning, 2(1), 3-10
28. Stafford, T. M. (2023, Jun 25). The Theoretical Compass for Online Learning: Exploring Social Learning Theory, Connectivism, and Merrill's First Principles of Instruction. Medium. Retrieved from https://medium.com/id-confidential/the-theoretical-compass-for-online-learning-exploring-social-learning-theory-connectivism-and-9562d66f14bc
29. Suarez. (2022). Sustainable Development goals in the COVID-19 pandemic. Sustainability.
30. Suzor. (2022, 12 30). The benefits of a 1:1 Laptop program for students in K-12 School.

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XVI, Issue I, January 2025

31. Tailor&Francis. (2023). Technology integration in English language teaching and learning:benefits and challenges. Cogent Education.
32. Ude Eze, O. (2021). Perceived usefulness, perceived ease of use in ICT support and use for teachers. IETE Journal of Education.
33. Zahle, J. (2021). Interpretivism and qualitative research. Stephen Turner and the philosophy of the social-brill.com.