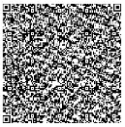

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Continuous Assessment of Learning Activities (CALA) in ICT Resource-Constrained Educational Environments: The Zimbabwean Context

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Abstract

This theoretical paper presents a critical analysis of the integration of Computer-Assisted Learning Activities (CALA) into the newly implemented competence-based curriculum in Zimbabwean secondary schools, particularly in the context of limited ICT resources. The study aims to contribute to the ongoing discourse addressing skepticism and resistance from parents, teachers, and learners, which hampers the effective implementation of CALA. Employing the Network Society Theory (NST) as a conceptual framework, we examine the potential benefits of CALA in aligning with NST principles and its capacity to mitigate digital disparities. The world is transitioning to geographically detached connections, individualized mobile lifestyles and teenagers should not be alienated from this global village. The article argued that in the NST, it is the role of the state to provide conditions for participation, which the Zimbabwean government has done through CALA, therefore, it is tantamount to malevolence if teachers and schools decide to deprive learners of this opportunity.

Keywords: Continuous assessment of learning activity, Digital divide, ICT, Curriculum, Resource constraints.

1. Introduction

In 1999 the Zimbabwe government carried out a commission of inquiry called the Presidential Commission of Inquiry into

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Education and Training or Nziramasanga Inquiry. The inquiry recommended a paradigm shift from an examination-oriented assessment to an experiential one that would develop appropriate competencies and traits. These findings by the commission were not acted upon for some time (Manokore & Shava, 2021). Zimbabwe then became a signatory to the Global Campaign for Education (GCE) Agenda 2030 with 17 Sustainable Development Goals (SDG) one of which is SDG 4.7, education for sustainable development and global citizenship (United Nations SDG 4). This entailed a transformation of education from academic orientation to a skills-based curriculum, which was in line with the Nziramasanga Commission. The transformation meant a change in learner assessment, hence the incorporation of CALA in the new primary and secondary school curriculum for all Zimbabwean learners (Zimbabwe Assessment Framework for Primary and Secondary Education 2015-2022). According to this same policy document, CALA is intended to measure, besides content mastery, skills acquisition oriented towards making learners productive, can create employment and be employable.

The Commission into Education recommended a complete overhaul of the previous curriculum on the grounds that it was not fit to prepare the nation to be a competitive player in the 21st-century global village, that the country needed an outcome-based approach to a new curriculum planning and implementation that included a paradigm shift in assessment tools (Mawere, 2013). Central to the report was a proposed complete revolution of the curriculum to a new competence-based one which among other tasks would develop skills for ICTs in learners and their efficient management (Gondo et al., 2019). That was 1999, and by 2023, research into the envisaged change reported that the new competence-based curriculum was as yet to achieve its goal of a fully participating nation in the 4IR and that assessment tools it came with were also yet to be fully implemented as well (Dzinotyiwei & Taddese, 2020; Maringosi, 2023; Firomumwe, 2022).

The Ministry of Primary and Secondary Education (MoPSE) developed a curriculum to support national and international developmental goals at the same time equipping students with lifelong learning skills for work and leisure through an assessment

framework that is multi-dimensional for the holistic development of learners in attitudes, knowledge and competencies needed for success in the world today and tomorrow (Zimbabwe MoPSE Assessment framework 2020). The competency-based curriculum introduced a hybrid exit examination for all exit points for learners: CALA and summative examinations. This was a deliberate move to ensure the learner's holistic development through real-world activities with 21st-century skills for survival in any environment and sustainable lifestyles (United Nations, 2022).

2. What is CALA in the Zimbabwean Curriculum?

CALA is defined as a learning assessment demanding that learners demonstrate their knowledge, be proficient and perform an understanding of concepts learned by producing actual goods or services (Firomumwe, 2022). This is required for each subject area that the learner will be doing at each exit point of the education system: grade 7, form 4, or form 6. CALA constitutes 30% of each subject's overall exit examination mark (Zimbabwe Assessment Framework for Primary and Secondary Education 2015-2022). The activities are project-based and follow the formal research process, incorporating practical activities of data collection through questionnaires, interviews, experiments, and observation and going on to present results and discussions in a concise write-up and presentation of artifacts (Maringosi, 2023). These projects differ from school to school as they are intended to solve local issues and problems. However, they are ensured that they meet the standard by the national examination board through external assessors at submission.

2.1. Knowledge/Information as Basic to CALA

CALA requires that learners engage in detailed research-based activities that follow the formal research processes and ethical data collection practices using questionnaires, interviews, observation and experiments (Firomumwe 2022). Topics are environment-related and school-based. The most critical resource of the Fourth Industrial Revolution (4IR) listed by the Network Society Theory is knowledge/information, which is critical for successfully carrying out CALA activities. Learners have to learn to sift the internet and access relevant information/knowledge for their particular research

area based on the theory learned in class on the same subject area (Maringosi 2023).

2.1.1. An Example of a CALA Activity for O Level English Language

CALA component: A; B; C; D; E

Level: Form 3

CALA Type: Practical

Syllabus Topic: Drugs

CALA Title: Drug abuse

Competences and Skills: Research, Innovation

Background

Drug abuse is a problem that is affecting the future of most youths. Schools are mostly acting as the training grounds for the consuming and ultimate abuse of drugs. Thus, it is imperative to find ways to curb this problem.

Part A

List the types of drugs being abused by students at your school

Carry out research on the causes and effects of drug abuse at your school

Design a pamphlet and/or flier that you will distribute to other students addressing the effects of drug abuse.

Part B

Write a report to your school head on your findings and recommendations for curbing drug abuse at your school.

Submit your completed research as a soft copy and a hard copy in a flat file

CALA Tip:

You are advised to use the Internet for research

Use questionnaires, interviews, or observations for your data collection

The learner is also provided with the rubric that the assessors will use to mark their work. As they carry out the CALA project, they are supervised by the subject teacher at each level of the research. The project follows the rigor of any research project with the added component of producing artifacts depending on the subject or project. Here in the English language, they produce a flier or pamphlet. In chemistry, it might be a reagent, in clothing technology, a specific garment from its design following research findings, and so on.

The external assessor/ moderator is also presented with a marking guide that reflects the rubric given to learners:

DIMENSIONS/ CRITERIA	**EXCELLENT**	**GOOD**	**UNSATISFACTORY**
5	5-4	3-2	1-0
Develop the ability to list drugs used by students in the school	Listing of any five or more drug types used by learners in the learner's school	Listing of 2 or 3 drug types used by learners in the learner's school	Listing of 0 or one drug type used by learners in the learner's school
5	5-4	3-2	1-0
Develop the ability to write a clear Abstract	4 or 5 elements of an abstract	3 or 2 elements	0 or 1 element in the abstract
5	5-4	3-2	1-0
Develop the ability to present a comprehensive and clear methodology	All aspects are given on how the research will be carried out	with 3 or less aspects	Muddled presentation
5	5-4	3-2	1-0
Demonstrating the ability to write stating the	Show the instrument	State instrument and not clear	A not so clear use of the data collection instrument

DIMENSIONS/ CRITERIA	EXCELLENT	GOOD	UNSATISFACTORY
process of data collection	and how it was used	on how it was used	
5	5	5	0
Develop an ability to present findings	Clearly stated findings linked to the data collected	3 0r 2 findings linked to data	1 or 0 findings linked to data
Develop a pamphlet /flier and report on recommendations to the school head	A flier or pamphlet with 4-5 effects of drug abuse	A flier or pamphlet with 3 or 2 effects of drug abuse	A flier or pamphlet with 1 or 0 effects of drug abuse

The 21st-century requisite skills that include self-sufficiency, collaboration, and critical thinking hinged on solution orientation are fostered by effective implementation of the CALA component. These skills are critical to the Global South which is inundated by problems ranging from political violence, poor economies, poverty-stricken populations, and corrupt governance (Odeh 2010). The entire CALA program is supported by ICTs; technology is the basis for the effective implementation of CALA. The whole learning process is based on the use of tools such as technology, science, and innovation which have become the narrative or language of the digital global country we all presently occupy as the human race. It should be appreciated that assessment for learning through CALA, "simplify the meaning of complicated learning targets; evaluate learners' capacity to take action; establish the extent to which learners can integrate skills, abilities, and knowledge; permit teachers to examine the thought processes learners employ and the products they produce; as well as be consistent with contemporary theories of learning". Hancock (2007 p.221). By exposing its digital natives to an education aligned with this digital reality, Zimbabwe has found a lasting solution to the lag in 4IR participation by countries in the Global South.

3. State of CALA Implementation in Zimbabwean Secondary School Education

The Zimbabwean education system is such that all primary school learners go through nine years which terminate at grade seven with an exit examination under the Zimbabwe Schools Examination Council (ZIMSEC) (Ministry of Primary and Secondary Education, 2015). This examination council provides a certificate that qualifies a learner to proceed to secondary education which is divided into ordinary level (O level) and advanced level (A level). At all these three exit points, learners have to pass final examinations that include CALA (Dokora, 2015). However, there are private secondary schools in the country that apply for and are allowed to offer an alternative examination for both O and A levels from the Cambridge examination council. Thus, all learners in public schools in the country, with effect from 2021, without exception, must produce CALA activities as a 30% component of every subject they sit for in an exit academic examination at the secondary school level (Ministry of Primary and Secondary Education, 2015).

CALA in Zimbabwean education is a new concept, as such there is a very limited number of research related to it. Sithole, Dziwa & Matsvange (2021) studied the perceptions of teachers on CALA implementation challenges and found that teachers lacked preparedness. They recommended staff development programs for teachers to ensure proper implementation of the curriculum innovation. In another study on the effectiveness of CALA by secondary schools in one district, researchers found that there was an outcry by teachers, parents, and learners as they were not clear on how the activities were to be done. They recommended that the government should involve teachers in planning the proper implementation of this assessment paradigm (*Nyamudzodza et al.,* 2022).

Firomumwe (2022) looked at the correlation between CALA in education and the industrial development of Zimbabwe. The findings indicated that CALA foisted and sharpened research skills, problem-solving, and practicality in education and creative skills. However, the study also found

negativity in teachers and hence poor implementation of the program. Another more recent research worth mentioning was done by Makamure & Jojo (2023) on the role of CALA in the improvement of mathematics competencies among secondary school learners. The study found that the benefits of CALA in this regard were very limited marred by teachers' failure to operationalize through a dearth in knowledge. However, the same study acknowledged the potential of CALA in equipping learners with skills to contextualize mathematics in everyday life.

This article, informed by these foregoing studies which highlighted the sorry state of affairs in the implementation of the CALA component of the curriculum in secondary schools, provides a theoretical view of the importance of CALA in the education of our children for the much-needed participation in the 4IR for an improved lifestyle for all citizens, hence solicit for support from all stakeholders to rally behind government initiative for successful implementation.

4. Theoretical Framework

4.1. The Network Society Theory: A Synopsis

The foremost theorist of the network society is Manuel Castells, who defined it as a social structure made up of networks driven by microelectronics-based information and communication technologies (Castells 2000). It is an evolving, spaceless, and timeless social structure whose human interactions are more and more technologically assisted through information streams and are altering daily human consumption, work, identity and relationships (Jan van Djik, 2006). Other outstanding characteristics of this network society are rapid asynchronous communications across geographically dispersed networks and connections, individualism, and a mobile lifestyle (Castells, 2011). Two major characteristics are exhibited by the network society; the presence of complex technologies of networked information and communication distribution system mediating an emergent array of political, economic, and social practices; A continuous reproduction of

networks between and among those societies as the fundamental form of human relationships and organization across varied economic, political and social configurations or structures (Worldsupporter, 2013). This network society is technological.

The world is in a state of a major upheaval or transition. It is in the process of a revolution, the 4IR and the most crucial resource this time around is information/ knowledge with technology development and diffusion as dynamic forces within (Castells, 2011). We are witnessing the rise of the global citizen who through the interconnected global economy and society has access to affordable goods and services online. Those with access/ plugged-in to information and knowledge benefit while those outside this network grid, are disadvantaged and beset with problems they cannot solve as they need to be networked to do so (Juneja, n.d.). Being involved in the information explosion era means getting the means of production in the global economic space and the ability to generate wealth as opposed to the manufacturing era (Juneja, n.d.). World states are called upon to play each one its role, which is to provide for those within its geographical borders conditions for innovation, competitiveness and flexibility (Worldsupporter, 2013), which Zimbabwe is endeavoring to do through a revised curricular that involves CALA.

According to Niemandt (2013), the world is witnessing the greatest migration in human history, from the physical world to the virtual on shared interests rather than shared space. Globalization is how humans live today and Balia & Kirksteen (2010) contend that over 175 million people have moved to a present-day diaspora virtually. Castells (2011) presents the elements of belonging, perception, knowing, and being known as core human yearnings that connected people have achieved through technology. The world has changed the term social media to mean community, where information indicators and sources are shared by members, and claimed that it has changed the social universe. Statistically, one out of every nine people on earth is on Facebook, spending 700 billion minutes there per month collectively while each user is there at least 15 hours per month, 250 million access it on mobiles from more than 2,5 million websites and sharing 30 billion pieces of content per month (Georgiev, 2023). This is about Facebook, added to other platforms

where information is shared, it boggles the mind and is evidence that everyone must connect for survival.

As can be observed from the foregoing discussion, the network society theory is wide and in a state of evolvement, We are going to focus only on four significant issues raised by network society theorists about the CALA component in the Zimbabwean secondary school curriculum. These issues are knowledge/information as a crucial resource, technology development and diffusion as a primary dynamic force, global migration to virtual space and distribution of power based on access to networks. We agree with Juneja (n.d.) that there is potential for a level playing field for individual development to an improved lifestyle if the government provides requisite conditions of innovation, flexibility and competitiveness. This narrative aims to contribute to the restoration of teachers' and schools' professional and critical role of breathing life into the curricular statements into learners' lives for the realization of the national goals of a fully participatory citizenry in the 4IR (Zimbabwe Assessment Framework for Primary and Secondary Education 2015-2022)

5. A Conceptualization of Principles of Network Society Theory to Validate CALA

The network society theory allows us to explore the dynamics of CALA as a new form of assessment of learning in an emerging technology-driven global village. As the theory explains the technological, institutional and cultural transformation of societies globally, through digital communication of information /knowledge, CALA is presented as an aid to the enlisting of marginalized societies of the third world countries onto platforms that transform their public service, politics, economies and everyday life. As this new society is emerging, CALA will help cover the gap of delayed participation (Maringosi, 2023).

Through the Network society theory, CALA helps learners to view society informed by ethics and integrity, values gained through research, tapping on their passion and genius, and changing the status quo instead of the old school where they would only protect knowledge. With CALA, they question knowledge and knowledge sources and actively make their societies better places through

research even before they leave school by finding solutions to their community problem or challenges (Rüfenacht, 2017; Mogren & Scherp, 2019; Ng & Friesen, 2018).

Research on Zimbabwe has shown that the generality of schools in the country is poorly resourced in terms of ICT tools (Dzinotyiei and Taddese 2020; Chigama and Goronga 2022). However, statistics from the country also indicated a household ownership of smartphones of 89.4% (World Bank 2020). This means that learners can engage technologically in their study areas learned in school without ICT integration to search for knowledge on the CALA under investigation at home. In this way, the digital gap is scaled when learners are made aware that they use the internet to work on their CALA activities. They engage on smartphones at home with the academic subjects learned in school to access information for their research activities, creating connections with peers and within the network society as they search for solutions to given challenges. Constant and consistent practice on the Webb helps them to migrate to the virtual global diaspora (Balia & Kirsteen, 2010).

Besides the rapid penetration of smartphones in Zimbabwe as reported by the World Bank (2020), the government through its post and telecommunications regulatory authority (POTRAZ), embarked on a free internet provision for rural schools in remote areas, 400 schools for each of the 8 provinces of the country (Mangwaya, 2022). Those rural schools off the country's electricity grid are benefitting from solar installation through the A global initiative which hosts 19 countries including Zimbabwe, called Giga (Nyakurerwa, 2022). While it is still true that public secondary schools are still poorly resourced in ICT tools for integrating teaching and learning, these government initiative programs and the availability of commercial data for some, have caused a marked reduction in the country's digital divide with a ripple effect of improved implementation of CALA activities in schools across the country.

One of the objectives of CALA listed by the Ministry of Primary and Secondary Education is to produce problem-solving-oriented citizens (Zimbabwe Assessment Framework for Primary and Secondary Education, 2015-2022). The CALA research activities are localized in the learners' school and community and are problem-based. In this way, there is a promotion of learning area integration,

the theory learned in class, and the practical aspect, context-based research for solutions to given problems through the CALA activity (Mwakandiedza, 2021). As they engage in information/knowledge search, they connect and begin to network with the World Wide Web, comparing their situation with the same aspect in other global environments to find solutions to their context (Kadungure, 2021). The most critical skill that learners gain as they engage on their digital mobiles as individuals or groups, is that of evaluating information from the Webb, the skill to use search engines, and being able to choose appropriate keywords for fruitful search (Mota & Cilento, 2020). These are invaluable skills for meaningful participation and citizenship in the digital global village, it is the language of the village.

5.1. Technology Development and Diffusion through CALA

It is a requirement that the CALA must always yield a tangible product or a performance as evidence of learning and findings are presented as both soft and hard copy files for assessment and moderation by external assessors. (Maringosi, 2023). For instance, as has been alluded to, a CALA activity for O Level English may be in line with finding a solution for drug abuse in the learner's school or community and require the production of a flier or pamphlet incorporating effects and solutions to drug abuse. As well in food science, learners may be required to find solutions using proper combinations of locally available foods to combat the prevalence of particular nutritional deficiencies like kwashiorkor in children in their communities and present fliers of food charts as solutions. As members of the global village, they source, create, and share knowledge in the process of carrying out such CALA activities (Bakhtiari & Shajar, 2006). The internet would yield for them the nutritional values of certain foods and sundry information on food classes and their value to the body.

As learners spend time on the internet through their mobiles, they become aware of their existence and participation as members of the global village and what it offers; global markets for affordable goods and services, global classrooms where they share knowledge with like students globally and they get to know people from other areas, their social norms and different social values. This knowledge

helps create a generation of individuals who value inclusivity, tolerate other cultures, copy or learn from other cultures, and bridge gaps of acceptance and diversity (Forgeard, 2022). These are valuable traits for a world torn by ethnicity, xenophobia, racism, and civil wars. Thus, promoting a culture of peace, and global citizenship where diversity in cultural values is appreciated (SDG-Education 2030 Steering Committee Secretariat).

Technological platforms also increase the sharing of technology itself (Bakhtiari & Shajar, 2006), one way is in the form of aspects of artificial intelligence, through which learners can be creative and innovative in the space provided by CALA activities. They become aware of the power of AI and how they benefit from it. These platforms foster 21st century skills that are said to be requisite for survival both in business and everyday life which include digital literacy and problem-solving (Kilinc & Altinpulluk, 2021). CALA demands that learners be able to store their data and findings and also for assessment purposes. This requirement enables them to acquire skills in synchronous communication giving them power for autonomous research and exchange of information (Jan van Dijk, 2006). They learn the use of databases and therefore, understand that cognition is not about cramming and head storage but machines can do that for them and by so doing increase their knowledge acquisition (Downes, 2022).

5.2. CALA Activities and the Global Migration Concept

Globalization means everyone, even our rural areas in third-world countries, are no longer separate entities but are part of a huge community where culture, knowledge, lifestyle and language are shared and have merged (Forgeard, 2022). The greatest advantage of globalization that learners enjoy through CALA is interconnectedness. Going back to the CALA activity of drugs for English, learners can ask Webb and other communities how they are dealing with the drug problem among those of their age, what great men and women are saying and what solutions are presented, they then benchmark for their social setting. Interconnectedness presents opportunities for interacting with cultures, a knowledge of

others different from them, and learning from others' experiences (Giddens, 2003).

CALA has the advantage of introducing learners to the global village, they are exposed to a new world where they can actively participate outside their initial CALA activity. Therefore, what the CALA aspect is doing in the curriculum besides imparting research skills leading to problem-solving, is to introduce learners to the global village and create room for them to migrate to this new diaspora (Bullas, 2011) despite the limited resources that characterize the schools to which they attend. Classrooms can be expanded to use available digital mobiles at home after school hours (Dzinotyiwei & Taddese 2020). As they surf the internet learners join the information revolution becoming digitally literate in many key aspects of the 4IR like the international labor markets and learn of the global needs of job markets and careers they can pursue (Abduhalimovna & Saidmashrafovna 2022). There is increased encouragement from the global internet for countries to participate in this new virtual world as connectedness in our diversity is viewed as a source of world peace (Forgeard, 2022).

5.3. CALA, an Entry Point to Access Networks and Networking as Power Dynamics

The competence-based curriculum would not serve a complete purpose if it left out an assessment of competencies in the area of ICT despite the dearth of ICT tools in the generality of the country's public schools (Zimbabwe Ministry of Primary and Secondary School curriculum, 2015). The CALA component provides for every learner who passes through any of the three exit points of the education system at the primary and secondary levels to come in contact with technology one way or the other and a production that demands proof of learning is needed for qualification to sit an exit examination (Tshili 2023). According to Tsapenko & Grishin (2022), there is rapid penetration of digital technologies into all social life domains of billions of people across the globe. Zimbabwe is part of the globe and learners are not isolated from this rapid penetration, and CALA as an academic demand, forces them on the Webb, making them active participants of the 4IR by default.

As they enjoy popular social activities online, the most common for teenagers being football, they are also drawn into the world of service provision and job alerts through random advertisements that appear as they watch (Tsapenko & Grishin, 2022). Networking begins there, from becoming one of a group of soccer fans to connecting to academic networks to accessing what Tsapenko & Grishin (2022) call telemigration, a situation where an employee is engaged by a foreign employer and works for another country through online platforms. This is most common with teaching jobs, especially language ones. The basic skills of proper research as a problem-solving tool through CALA, are designed as an entry point that affords learners a personalized learning ground for innovation and also a chance to marry theory and practice in the academic subjects they learn in school (Maringosi, 2023).

In the process of carrying out the CALA research activities under the supervision and mentorship of the teachers, learners get in contact with the ideals explained by the network society theory, ideals of honesty, integrity and good citizenship (Castells 2000). They also come into contact with the dark side of technology; ideas of examination cheating, cybercrime, and hacking (Wellisz, 2016). Teachers get the chance to highlight the benefits of technology; access 3-D visuals for learning, use GPS for directions, online interviews and classes from across the world, online shopping, banking and huge amounts of information at the fingertips; also the dark side of internet (UNESCO, 2020). This is an invaluable chance teachers get to instill right, just like they do with other aspects of life through the classroom, the eternal role of the teacher to shape lives and society is much more needed in the 4IR than ever before. It becomes easy for the teacher to deal with 4IR negative issues from a practical perspective and help instill ethical methodologies of research at a very early age.

6. Significance of the Argument

This article has its strength in the way it broadens the horizon on the most possible avenues that the CALA component of the Zimbabwean primary and secondary curriculum entails. It does this by engaging with theory in its attempt to conscientize stakeholders especially teachers, on the greater harm done to learners if deprived of the exercises through CALA, given that they learn in resource-

constrained environments. We believe that, unlike any other article on the importance of CALA as part of the overall assessment of learners at exit points in the ministry, our article is unique in the way it explains CALA through the theory of the network society to reawaken the teachers their unique role as agents of societal change, especially that their skills are needed in this era where the 4IR has opened a window for poor countries to raise their standard of living through active participation in the revolution.

There has been mud-slinging across social media platforms in the country that teachers were doing CALA for learners for a fee and that parents were calling out the government to remove it and politicizing it (Maringosi, 2023), we believe this article will shed light on all stakeholder that despite the challenges involved in the total implementation of CALA (Mwakandiedza, 2021), its relegation causes more harm than good to our learners and the nation at large in the near future considering the rapid technological changes taking place globally right now.

The other strength of the article is its all-encompassing address to all stakeholders, including the parents who may not be intellectual yet are key players in the successful implementation of CALA as public schools lack requisite resources for learners to engage with technology in carrying out their research. The parent is aware that instead of buying CALA projects for their children from rogue teachers, they can use the money for network bundles and become part of the agents of national change and development. The article further recommends that the government engage all stakeholders through workshops and staff development programs on the far-reaching impact of CALA if properly implemented.

7. Conclusion

This article is an attempt to contribute to the ongoing narrative of trying to bring to the fore the important relevance of CALA to the 4IR environment education. Through the network society theory, we argued that depriving learners of the window that CALA provides into the wider global village in this digital age is tantamount to a serious breach of children's right to quality education. The paper called upon all stakeholders to while there are implementation challenges, let them be dealt with while learners are engaging in

CALA activities as intended by the curriculum, as we all miss out as a nation if they become passive observers of the 4IR.

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