

# **Status of ICT Infrastructure towards the inclusion of ICT in the new curriculum in the Hohoe Municipality, Ghana.**

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## **ABSTRACT**

*In many global contexts, educators have recently embraced and integrated information and communication technology into the foundation of classroom instruction (Fullan, 2012). As a result of the global adoption of ICT, Ghana's instructional system has changed. The National Council for Curriculum & Assessment (NaCCA) and Ministry of Education (MOE) introduced the Common Core Programme (CCP) in September 2020 to enhance the relevancy and applicability of the educational process in the pre-tertiary school curriculum by incorporating ICT into the educational curriculum. The curriculum emphasizes character development and value nurturing, in addition to ensuring streamlined advancement for all schoolchildren from Pre-Senior High School and providing a pathway for both academic and professional development. As a result, pre-tertiary teachers and schools are now expected to incorporate ICT into the national curriculum. The study included 234 respondents, all of whom were teachers. Random sampling was used to select the survey's tools, questionnaires, and respondents. Descriptive statistics were used to examine the data in SPSS version 26.0. The findings of the analysis revealed that teachers frequently use ICT in the delivery of their lessons. It was also noted that the schools lacked the necessary infrastructure and assistance to ensure a smooth transition to the new curriculum. According to the study, the government and other interested parties should help schools by providing ICT infrastructure.*

**Keywords:** *information, communication, technology, infrastructure, incorporation, availability, quality education.*

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## **I. INTRODUCTION**

In modern educational system, information and communication technology (ICT) infrastructure can play a vital role in transforming teaching, acquiring knowledge, and assessment strategies for students and educators (Tondeur, Van Keer, Van Braak, & Valcke, 2008)

It is widely acknowledged that schools and educators are unceasingly working to improve how they instruct, how their students are learning, and how education is examined. It is critical to integrate ICT infrastructure into the educational system at all stages (Lowder&Regmi, 2020).

ICT is now widespread throughout society, and it is transforming the way we live our everyday lives. It has the potential to support education metamorphosis in classroom instruction, having to learn, and assessment procedures, while also being able to relate school curriculum to social and economic advancement (Chapman & Mahlck, 2004). Correspondingly, there is substantial evidence that digitalization completely change how students are learning, how instructors teach, and the circumstances in which learning occurs (Voogt, Knezek, Cox, Knezek, & ten Brummelhuis, 2013).

ICT has changed the way academic performances such as classroom instruction, continuing to learn, scientific studies, and intensification are conducted at the level of higher education. ICT has assisted in overcoming location and time impediments and reducing the long gap between both the information being generated and its utilisation by the final consumer.

The National Council for Curriculum & Assessment (NaCCA) & Ministry of Education (MOE) in September 2020, introduced a new curriculum and assessment reform that is, the Common Core Programme (CCP) to enhance effectiveness and relevance of the educational process in the pre-tertiary school curriculum by including ICT into the educational curriculum. The curriculum focuses on character building and values nurturing, most importantly, ensuring seamless progression for all learners from Pre-Senior High School and creating a pathway for academic and career development.

According to the New Curriculum in the new reform (NaCCA, September, 2020), the justification for including information technology in this educational curriculum as a pedagogical education and instruction aid

is to deeply promote independent knowledge acquisition (education). Below are a few of the anticipated results that this curriculum seeks to achieve through ICT incorporation:

1. enhance lesson delivery and learners' knowledge retention processes;
2. enhanced uniformity, excellence and speed in the teaching and learning processes;
3. increased chances for more learner-learning pedagogies;
4. upgraded inclusive gender education;
5. enhanced co-operation, creativity and higher-order critical thinking skills among learners;
6. enhanced elastic and distinguished method of teaching;

The adoption of Information and Communications technology as a means for education and formal instructions is to give students entrée to enormous amounts of information via the internet. And also provides the outline for analysing information, examine geographical trends and associations. When learners research and come up with data, they then use ICT to process it into information, after which they can easily learn and comprehend. ICT integration allows learners to be introduced to a huge number of ICT tools. Examples such ICT tools are personal digital assistants, calculators, radios, cameras, phones, televisions and personal computers. It helps learners to be abreast with software like Mavis Beacon, Microsoft Encarta, the Office suite which contains Excel, PowerPoint from Microsoft Corporation which serve as teaching and learning aids. The introduction to using ICT for rubber-necking learning that students receive at the pre-tertiary level can boost their self-esteem and inspire them to utilize ICT in the near future, both inside and outside of formal schooling. Information and Communications Technology as an education and instruction tool is geared towards the enhancement in learners' level of competence in the Reading, wRiting, aRithmetic and cReativity

Throughout Africa, the use of ICT infrastructure in education remains in its initial stages, and the majority of African nations end up falling behind because of technological innovation due to the slow accelerated rate at which ICT is being incorporated into their educational settings (Lloyd, 2020). Regrettably, notwithstanding the embellished ICT policies being in place, most emerging nations, including Sub-Saharan Africa, such as Uganda, Ghana, Liberia, Kenya, Zambia, and Sudan, have limited effectiveness and utilization of ICT in Schools. Their initiatives are not able to respond to the specific requirements of the education industry, with an increasing focus on the application of ICT for economic outcomes even outside education (Achimugu, Oluwabemi, & Oluwaranti, 2010). As a result, there has been a slack in latest technological implementation due to various financial problems, a dearth of primary consideration for academic achievement, narrow minded equity, based on culture and negligible mindsets more towards the digital realm.

In addition, computer systems, Disc, interactive entertainment, routers, satellite systems, videoconferencing, and other online mediums are used in instruction to support teaching and learning (Tileston, 2004). Utilization of ICT in teaching could include numerous different facets such as the following: the process of developing guidelines, the choice of materials and instruments to create and carry out a layout, construction assessments, the efficiency of working as a team, and the incorporation of technology to aid in the creation and presentation of guidance (Tondeur, Krug, Bill, Smulders, & Zhu, 2015).

Adoption and integration of ICT in teaching and learning have been hampered by a lack of ICT infrastructure. In advanced nations, the average access to ICT infrastructure is one computer for every 15 students, but in Africa, the actual computer class size at the university level is 1:45. (MoEST, 2005). This low infrastructure ratio does not allow for the development of areas of expertise in the application of ICT for education and learning. Many research findings that confirm this assertion find that teachers' belief systems, schooling system, outdated curriculum content, and conventional instructional techniques are all barriers to the efficient use of ICT in schooling (Arnold & Sangrà, 2018).

#### Problem Statement

As the background indicated, the government of Ghana implemented a new curriculum into the educational system in September 2020. The new curriculum was intended at addressing the gaps in the old curriculum and promoting teamwork, problem-solving and critical thinking, creativity and innovation, interpersonal development and leadership, communication and collaboration, cultural identity and global citizenship, and digital literacy skills acquisition (NaCCA, 2020).

In addition, the new curriculum seeks to improve the teaching and learning of all subjects, concentrating on learner-centered pedagogies and improving the use of ICT as a teaching tool while emphasizing pedagogies with a focus on equity and inclusion (GhanaWeb, 2019).

The Ministry of Education (MOE) in connection with the teacher unions in Ghana implemented the one-teacher one laptop policy to supply all teachers' laptops to help them integrate ICT into the new curriculum. The National Teaching Council (NTC) responsible for incising in the quest to help teachers integrate ICT into the new curriculum has been organizing online training for teachers regularly to abreast them with the needed ICT competence level to integrate technology into the new curriculum. **Besides, the new curriculum has also attached high importance on the incorporation of ICT in all subject areas in Ghana (MOESS, 2010).**

Having done all these, it necessary that the teacher who is at the centre of the implementation of this curriculum, ought to have the capacity to integrate technology into education and instruction. Teachers' technology incorporation ability is inextricably tied to the success of the new curriculum. However, it is not clear the extent to which basic school teacher in the Hohoe municipality are capable of integrating technology into the new curriculum. The MOE and NTC need to have data on the level of teachers' capacity and readiness for ICT integration. This will provide stakeholders with the necessary information and knowledge gaps that need to be filled. It is against this backdrop that this study seeks to evaluate the status of ICT infrastructure toward the incorporation of ICT into the new curriculum in the Hohoe municipality

**Purpose of the Study**  
To establish the evaluate the status of ICT infrastructure toward the incorporation of ICT into the new education curriculum in the Hohoe Municipality, Ghana.

## **II. LITERATURE REVIEW**

### **Status of the ICT Infrastructure in the Hohoe Municipality.**

ICT infrastructure includes both software and hardware, such as computers, scanners, photocopiers, mobile phones, printers, projectors, and broadcasting technologies such as radio and television, as well as essential software such as Microsoft Office, Encarta, communication applications, and internet software that improves teaching and learning. The ICT infrastructure in the school must have network and internet connectivity in order to facilitate and simplify information sharing and distribution among teachers and students. Researchers agree that ICT infrastructure should be easily accessible and used by everyone ( Yilmaz, 2011). Schools should use multimedia features to spur instruction as well as provide thrilling possibilities for students (Neyland, 2011). A networked school is one that not only has a network infrastructure, but also one that benefits from it. (Bielefeldt, 2012) CT Infrastructure, like ICT curriculum, has a direct impact on the outcomes and results of instructions and education.

The existence of ICT infrastructure provides an educational atmosphere that nurtures independent thought, teamwork, and problem-solving amongst learners (Kimanzi, Bwire, & Miima, 2018). In other to use ICT infrastructure in instructions and education, numerous nations have tried to create national educational policies that will steer as well as guide the integration of ICT into social and educational programs (Hallissy, Butler, Hurley, & Marshall, 2013).

The deployment of ICT infrastructure in instructions is still in its developmental stage in most African countries, and such developing nations run the risk of falling behind in the case of technological development due to various their slow pace and rate at which ICT is incorporated into their educational systems (Lloyd, 2020). According to Tondeur, Krug, Bill, Smulders, and Zhu (2015) the process of instructional design and usage, the choice of resources and techniques to put together and implement a good design, proper evaluations of designs, the efficiency of working as a team, and the deployment of technology to push the improvement and delivery of lessons are just a few of the aspects of the application of ICT in instruction that could be considered.

### **State of the ICT infrastructure in Teaching and Hohoe Municipality.**

Before implementing ICT infrastructure in school settings, a thorough justification must be developed. Through broad sense, as personal computers becomes more widely available, it's indeed critical that educators refrain from becoming enthralled in the equipment and instead focus on one's main responsibilities as instructors. Instructors must broaden their own creative abilities with the knowledge that as computer technology evolves, they will be capable of accomplishing even more their objectives (Papaioannou& Charalambous, 2011).

The emphasis in education has always been placed on subject matter. For several years, course work has been centered on curriculums. Presentations and seminars were intermixed with tutorial videos and acquiring knowledge activities that are designed to solidify as well as reteach the subject matter. Education system that seeks to promote expertise and achievement is already preferred in modern fiction. Syllabuses have begun to emphasize functionality and are particularly worried with how knowledge will be used rather than what the knowledge is. Modern ICT could provide huge backing for all of these prerequisites, and there are currently many excellent examples of world scenarios for performance and success education system that facilitate efficient use of these scientific developments' abilities (Kopcha, 2012).

Adoption of ICT infrastructure in learning environments offers numerous facets of knowledge renovation, while as more pupils utilize ICT in their learning processes, their effectiveness becomes more noticeable. Instructors tactically use ICT to enrich knowledge acquisition to create sense of meaning and purpose and stimulating learning experiences for their learners. Schoolchildren enjoy studying and the independent investigation that appropriate and creative ICT use promotes. The research reveals that extremely few school systems used ICT primarily for computer classes and office work.

### III. METHODOLOGY

The study adopted a questionnaire from Davis (1989), Bonsu et al. (2021) and Srite (2006). The questionnaire was administered to the teachers. The Questionnaire was distributed online and at the end 234(100%) respondent too part in the studies, 20(12%) headteachers and 214(88%) teachers. The questionnaire's items were all closed-ended questions. Statistical Product for Service Solution (SPSS 21.0). was used to analyse each response to each question in the questionnaire. Research questions one and two were analysed using mean and standard deviation, which are descriptive statistics.

### IV. DISCUSSIONS

Availability of the ICT Infrastructure in schools.

The study sought to evaluate the availability of the ICT infrastructure schools in the Hohoe Municipality.

Table 1. Availability of the ICT Infrastructure

Respondents	Computers		Internet		Projectors		Television		Printers	
	Yes %	No %	Yes %	No %	Yes %	No %	Yes %	No %	Yes %	No %
Headteacher	40.0	60.0	0	100	15.0	85.0	25.0	75.0	20.0	80.0
Teachers	23.3	76.7	0	100	18.7	81.3	22.5	77.5	9.3	90.7
Total	63.3	36.7	0	200	33.7	66.3	27.4	72.6	29.3	70.7

Field data, Adade (2022).

State of the ICT Infrastructure in Schools.

Table 2. State of the ICT Infrastructure Schools.

Respondents	Computers		Internet		Projectors		Television		Printers	
	Yes %	No %	Yes %	No %	Yes %	No %	Yes %	No %	Yes %	No %
Headteacher	35.0	65.0	0	100	10.0	90.0	15.0	85.0	10.0	90.0
Teachers	20.3	79.7	0	100	10.1	89.9	22.5	77.5	9.3	90.7
Total	55.3	44.7	0	200	20.7	79.3	37.5	62.5	19.3	80.7

Field data, Adade (2022).

Availability of ICT Infrastructure Facilities in the Schools

Table 1 shows the results. On the availability of ICT infrastructure in school in terms of computers, internet, projectors, television and printers 35.0% of the headteachers' respondents indicated not having computers in their schools and 65.0% indicated otherwise, 20.3% of the teachers indicated that their schools had computers while 79.7% indicated not to have them in their schools.

On the availability of internet 0% of both teacher and headteacher indicated that none of their school had internet connectivity. This showed that not of the schools in the municipality is equipped with internet connectivity to do online learning.

When respondents were questioned on the availability of projector in schools 10% of headteachers and 10.1% of teachers' response was yes whilst 90% of headteachers and 89.1% of teachers responded no.

Again, when respondents were questioned on the availability of television in their various schools, 15% of headteachers responded yes and 85% no. Teachers in the municipality has 22.5% yes and 77.5% no.

Lastly on the availability of printer in the schools in the municipality, 10% of headteachers respondent accepted having it and 90% otherwise. 9.3 of teachers also responded yes while the greater percentage (90%) responded to the negative.

State of the ICT Infrastructure

According to the results in **Table 2**, 35% of headmasters' respondents indicated that the state of computers in their schools was good while 65% indicated it was bad. 20.3% teachers indicated it was good while 79.7% indicated they were bad. The findings suggest that the state of computers in majority of schools that have few computers is bad.

On state of internet in schools in the municipality, 0% of both teachers' and headteachers' respondent indicate the state was bad since none of the schools had internet connectivity.

When the state of projectors was inquired, 10% of the headteachers' and 10.1% teachers' respondents who were in agreement that projectors were available in their schools were in good state while 90% of headteachers and 89.9% teachers indicated projectors were at bad state.

On the state of television in schools, 15% of headteachers and 22.5% teacher accepted that television in their schools were in good state while the majority of headteachers and teachers responded to the negative. That is, 85% of teachers and 77.5% teachers accepted that television set in their schools is in a bad state.

Lastly, on printers 10% of the headteachers and 9.3% of the teachers accepted that printers available were in good state. 90% of headteachers and 90.7% of teaches accepted that the state of printers in their schools is bad.

## V. CONCLUSION

Availability of ICT Infrastructure Facilities in the Schools

On the availability of ICT infrastructure in school as shown in Table 1, in terms of computers, internet, projectors, television and printers 35.0% of the headteachers' respondents indicated not having computers in their schools and 65.0% indicated otherwise, 20.3% of the teachers indicated that their schools had computers while 79.7% indicated not to have them in their schools. The findings indicate that many schools in the municipality did not have ICT facilities hence had no chance of using them in teaching and learning activities in their respective schools.

State of the ICT Infrastructure

Findings in **Table 2** indicated that the state of computers in majority of school in the Hohoe municipality was poor; internet was also poor therefore a hindrance in ICT teaching and learning.

## VI. RECOMMENDATIONS

Based on the conclusions of the study the following recommendations can be suggested the following:

a) The government with other stake holders should assist schools with initial the ICT infrastructure facilities. This would ensure common take off and even use of ICT infrastructure in teaching and learning in all schools in the municipality.

c) The government should ensure it provides ICT infrastructural support to all school by ensuring that there are enough ICT trained technicians to repair ICT infrastructure facilities when they break down. This would ensure that once ICT facility broke down, they are repaired for continuous use in teaching and learning in the schools.

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