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Research Paper

Impact of Infrastructural Support on Integration of ICT in Curriculum implementation In Public Secondary Schools in Makueni County, Kenya

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ABSTRACT
Digital Literacy is one competence among the seven competencies to be developed in the 21st centurylearner.Despitethisfact,manyeducatorshavefailedintraininglearnerstoacquireDigital Literacy through integration of Information Communication Technology (ICT) in curriculum implementation.Thepurposeofthisstudywastodeterminetheinfluenceofintegrationof ICTin curriculum implementation in public secondary schools in Makueni County, Kenya. Theobjectiveofthestudywasto"establishtheextenttowhichinfrastructuralsupportinfluences integration of ICT in curriculum implementation in public secondary schools in MakueniCounty. The study used descriptive survey research design. The targetpopulationwas52secondaryschoolprincipals,700teachersandonesub-countydirectorof education. Data was collected using questionnaires and interview schedules. The sample size was 16 principals from 16 schools, 25 teachers from secondary sub county schools and 45 teachers from secondary county schools. Teachers' sample was obtained by stratified sampling, coupled with proportionate random sampling to get the number of the teachers in each stratum of Sub County and county schools required for the study. The data collected was analyzed using both quantitative and qualitative data analysis approaches whereby both descriptive and inferential statistics were used. Descriptive statistics used in this study included percentages and mean. The inferentialstatisticsusedwasPearsonproductcorrelationcoefficientmoment.Thequalitativedata was presented in the form of narrative and integrated within the quantitative data in graphs and frequency tables. The study established that well developed ICT infrastructure positively influences ICT integration in implementation of curriculum as majority of respondents (57.5%) indicated well established infrastructure influences ICT integration to a great extent and 20% to some extent. This brought out the glaring truth that principals who do not employ ICTexpertintheirschoolslimittheextenttowhichtechnicalsupportisofferedtotheentireschool fraternity in ICT integration in curriculum implementation.

Key Words
Curriculum, implementation, infrastructure, information, communication and technology, integration, teaching,
learning

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I. INTRODUCTION

Many of the productivity gains in the entire world economies over the past three decades can, to a great extent, be attributed to the impact of ICT. Information Communication Technology (ICT) has been used in education and training as a priority in most European countries during the last decade although progress has been varying in different countries (Pelgrum, 2005). Some of the countries have adopted use of ICT and perfected infrastructure at a faster rate. In most developed countries such as UK, schools have implemented the use of ICT in teaching and learning into the curriculum and demonstrate highlevelofeffectiveandappropriateusetosupportteachingandlearning.(OECD,2004). Globally it is recognized that teachers and schools are constantly engaged in enhancing how they teach, how their students learn and how learning is assessed. It is essential to embed ICT infrastructure in the education system all levels (Lowder&Regmi, 2020). It has the potential to support transformation in teaching, learning and assessment practices in schools and it can connect educational policy with economic and socialdevelopment(Chapman&Mahlck,2004).Similarly,thereisgrowingevidencethatdigitaltechnologies change thewaystudentslearn,the wayteachersteach,andwhereandwhenlearningtakes place (Voogt, Knezek, Cox, Knezek, & ten Brummelhuis, 2013).

Learners need more open-ended learning experiences that develop the learners' higher- order thinking, creativity, independence, collaborating and ownership of learning. When the ICT infrastructure is used effectively, it can provide opportunities for all teachers, students and parents/guardians to develop these Key Skills (Bariu, 2020). This is not the case in developing countries where most of them are struggling to put up ICT infrastructure.Haggins (2005), in his study on ICT integration in teaching and learning in New Castle university, UK points out that, countries that have integrated ICT into their education system have benefited by creating enabling environment for teachers and students toconstruct rich multi-sensory, interactive environments with far reaching implications on teachingandlearningpotentialresultingfromICTintegration.Computersandinternetare usefulinincreasingteachers'basicskillsandsubjectmastery,toprovideresourcesthatcan later be used in classroom, and to help teachers to familiarize with specific instructional approaches. The ICT tools increase interaction and collaboration amongst teachers of a particular subject hence form a platform for sharing teaching and learning ideas. The fast growth of the global economy and the information based society has put pressure on educationsystemsalloverthe worldtouseICTstoteachthe21st Centuryskillstolearners (World Bank, 2004). The growth of the ICT sector has challenged teachers to prepare for effectiveuseofthenewteachingandlearningtoolsintheirteachingprofession(UNESCO, 2005).

According to a study conducted in Malaysia by Granger, Morbey, Lotherington, Owston, &Wideman (2002), that sought to explore the facilitating conditions that are associated with teachers' laptop use in terms of ICT infrastructure, technical support, and administrative support in a school setting it was established that upon realizing the important feature of instructive and learning landscape through Information and Communication Technology (ICT) the Malaysian government has begun to invest profoundlyintheeducationsystemtoopenawiderscopeofICTandcreateadynamicICT environment for learning. However, based on the findings, it was reported by one of the teachers that the outdated hardware limits the use of computers in instruction. The teacher wasnotabletointegratetechnologyintoinstructionduetotheoldandoutdatedhardware. Conversely,oneoftheinformantsstatedthatlimitedsoftwareactasoneoftheantecedents that prevents the use of computers as an instructionaltool.

As Akubuilo and Ndubuizu (2007) rightly notes a high percentage of teachers and lecturers in science subjectsinNigeriaarecomputerilliterate.Fromthisstandpoint,itisobvioussuchteachingstaffwillfinditextremelydifficulttodeliverICTcompliant educationandtraining.Power supply in Nigeria is epileptic. ICT facilities are power driven. In urban cities where there is power supply it is irregular and therefore interrupts the effective use of ICT facilities. Further, low level funding has resulted in low level provision of ICT facilities in schools. Gbadamosi (2006) observes that education is grossly underfunded in Nigeria and has affectedmanyareassuchasthefundingofICTproject,trainingandretrainingofteachers, and development of software packages. The problems are further aggravated by the fact ICT has not been fully integrated into the curriculum of primary and secondary education in Nigeria. Not until the national policy on education is revised to fully integrate ICT in the curriculum the problem will stilllinger.

Curriculum implementation entails translating the curriculum into courses of study, syllabusesandsubjects.Theprocessinvolvesfacilitatingthelearnertoacquireknowledge, skills and attitudes so as to function effectively in a society by acquiring the desired learning outcomes. Viewed from this perspective, curriculum implementation also refers tothestagewhenthecurriculumitselfasaneducationalprogramme,isputintoeffect.The requirements for curriculum implementation include pedagogy, teaching and learning materials, facilities, school climate, capacity development for curriculum implementers and financial support.According to a study by Ogbonnaya (2010), ICT integration in curriculum implementation transforms the method of delivering the content between the teacher and the learner by among other aspects, creating an easy access to information. The use ofICTinteachingandlearningassistsstudentstobeabletodrawacomparisonfrommore than one variable thus widening the scope of learning, this goes a long way in developing innovation and creativity. Ogbonnaya (2010) further maintained that the use of ICT in teachingandlearningmotivatestudentsandcouldinstillthelearningcuriosityifemployed correctly, enabling students to want to learn further. The integrated ICT curriculum pedagogy allows students to use computers to access information and form collaborative groups to solve complex tasks in various learning areas.

ICT infrastructure include the availability, suitability and use of ICT tools such as hardware, software, internet access and peripheral equipment provided in the school (Vanderlinde and van Braak, 2010). These ICT recourses and facilities in schools should be designed and enabled in the direction of supporting continuous transformation and development of various learning approaches to integrate ICT in curriculum implementation.AvailabilityandaccesstoICTinfrastructureofschoolsorlike;buildings, electricity, fixed telephone and digital instruction facilities, educational satellite and solar energy sources as spare in case of the electrical supply interruptions are key prerequisites to the integration of ICT in curriculum implementation (Elmunsyah, 2012; Lu et al., 2015;Schreurs, 2007).

The Government of Kenya appreciates and recognizes that, an ICT literate workforce is the foundation on which Kenya can acquire the status of a knowledge economy (Republic ofKenya,2005).InformationCommunicationTechnology(ICT)integrationincurriculum implementation is described as the means of using any ICT tool such as computers, internet,e-learningtechnologiesandCDstoassistteachingandlearning(Williams,2003).
AccordingtoaKenyacountryreportcontainedinaSurveyofICTandeducationinAfrica, Kenya has made remarkable progress putting in place an ICT policy framework and implementation strategy, complete with measurable outcomes and time frames. However, universal implementation is challenging given the lack of resources, national ICT infrastructure, and even electrical supply – particularly in the rural areas (Farrell 2007). The Ministry of Education's policy framework indicates that there are a number of challengesconcerningaccesstoanduseofICTinKenya,includinghighlevelsofpoverty, limited rural electrification, and frequent power disruptions. Most secondary schools have somecomputerequipment;however,thiscouldconsistofonecomputerintheofficeofthe school head. Very few secondary schools have sufficient ICT tools for teachers and students. Even in schools that do have computers, the student-computer ratio is 150:1 (Republic of Kenya2006).

From the above discourse it is evident that ICT integration in education is not without challenges. That assertion necessitatedthecurrentstudywhichsetsout to determine the impact of infrastructural support on integration of ICT in curriculumimplementation in public secondary schools of Makueni County, Kenya

II. LITERATURE REVIEW

AstudyinMalaysiain2010byVanderlindeandvanBraak,usedqualitativestudyamong forty school teachers to determine and examine regularly occurring factors that affect the implementation of the technology among the school teachers . According to the study it emergedthatteacherswillperceivegreatercontroltoemploytechnologyintoinstructional use when they have the necessary hardware and software resources. The study concurred with Cowie and Jones (2005) in Malaysian schools who reported that with the ICT infrastructure provided, teachers were able to access school network, the Internet and laptop accessories (printer, digital camera, data projector, large TV screen, scanner and video camera). Hence, the educators have more prospects to utilize instructional technology when the ICT infrastructures are provided in a well manner. Past research studies have shown clearly that ICT infrastructure can be one of the factors that influence the technology use among the teachers (Cowie& Jones,2005).

Samuel and Zaitun (2007) researched on the adequacy of ICT resources and the right ICT Skills for teachers in integrating ICT tools in teaching and learning of English Language in Malaysian schools. A survey was conducted over a period of five months. Data was collected by use of questionnaires. The survey findings revealed that 81.7% schools have computer laboratories, 64.2% said personal computers are connected to the central server and 48.6% have computers for use. However, majority of computer laboratories are inadequate in specifications and quality hence inadequate use.

Swarts and Wachira (2010) report that high cost of internet connectivity and poor electricityconnectionsinruralareasposeachallengetoICTintegrationinruralareas.The reportfurthernotesthat58.9%ofcomputersinallschoolsarenotconnectedtotheinternet except one school where all 50 computers are connected; that schools in rural set up are unable to use ICT due to internet inaccessibility and affordability, limited rural electrification and frequent power disruptions. At the national level, Minishi-Majanja (2007) observes that affordability of ICT infrastructure could be limited by the high cost of putting infrastructure in place and is linked with the issue of poverty. At the institution level, expensive hardware and software as well as the high cost of communication and services restrict access to ICT. Most schools in Kenya do not have the means to purchase expensive computers and hardware to provide training for their staff. Affordability could beachievedthroughtheuseofopensourcesoftwareorcheaperversionsofsoftwarewhich canoperateonolderprocurementorrefurbishedcomputers,redesigningofhardwaresoas to lower the cost of internet access, merging internet technology to use television connectionwithmodificationandusingcommunitywirelessLAN(LocalAreaNetworks).

Kukali(2013)didastudyin Kenya whichsoughttoestablishopportunitiesavailableandchallenges faced in use and integration of ICT in public secondary schools management in Bungoma South District, Kenya. The study employed descriptive survey design. The study populationcomprisedof36Principals, 36DeputyPrincipals,36Directorsofstudiesand4 DistrictQualityAssuranceandStandardsOfficers.Saturatedsamplingtechniquewasused to select three Quality Assurance and Standards Officers, 32 principals, 32 Deputy Principals and 32Directors of Studies. Data collection instruments were self-administered questionnaires and interviews. Quantitative data was analyzed using descriptive statistics in form of frequencies counts and percentages while qualitative data was analyzed on an ongoing process as themes and sub themes emerged. The results of the study reveals that 100% of principals, 93.8% of deputy principals and 90.6% of director of studies cite lack of adequate ICT infrastructure as a major challenge in use and integration of ICT in management.In50%oftheschools,respondentsobservethatthereisinadequateroomforICT equipment hence congestion limiting teachers to make maximum use of computers andtheinternet.Mostrespondentsreporteitherlackoforpoorinternetconnectivitywhich is a hindrance to communication and linkages through email andfax.

The school management does not make adequate use of the internet for purposes of professional and educational resource; yet such processes brings into focus best management practices such as decision making and problem solving (Kukali, 2013). However, this study identified a research gap in the influence of ICT infrastructure and its integrationinmanagementofpublicsecondaryschoolsinMakueniCountyconsideringthe localeofthestudy.Ogachi(2015)observethattheavailabilityofinfrastructure,especially computers,influencedtheintegrationofICTbytheprincipalsintheiradministrativetasks. For those principals' offices with operating computers, a fair number had reliable internet connection.

III. RESEARCH DESIGN AND METHODOLOGY

The current study adopted a descriptive survey design in order to determine the impact of infrastructural support on ICT integration on curriculum implementation in public secondary schools inMakueni County, Kenya.The target population for the study was 52 public secondary school principals, 700 teachers and 1 County Director of Education (SCDE). The county director was purposively sampled while the study sampled 30% of principals and teachers. Twenty- seven sub county schools and twenty five county schools were stratified sampled. The strata included teachers in the sub county schools and teachers from the county schools. Once this was done, proportionate random sampling was exercised to determine the number of teachers in each stratum required for the study. Each teacher in that sub populations was assigned a number. Therefore, each teacher had an equal chance of being picked to participate in the study. Teachers corresponding to the numbers were included in the sample. The sample size included 16 principles, 60 teachers and 1county director of education.

DATA COLLECTION INSTRUMENTS

The purpose of a tool or instrument in research is to measure the variables of the study (Mugenda, 2011). This study used questionnaires and interview schedule as tools for data collection.Thequestionnaireswereadministeredtoprincipalsandteacherswhileinterview schedule was administered to the County Director ofEducation.

IV. RESULTS AND DISCUSSION

The study sought to determine the impact of infrastructural support on ICT integration in curriculum implementation in public secondary schools in Makueni County. Theresultsshowedthatmajorityoftheprincipals(37.5%)hadbetween1–5functionalcomputerswhich were mainly found in the accounts office, secretary's office and the departments for the county schools. 25% of the schools had between 6 -10 functional computers which the principals indicated that the computers were in offices for official use for the School ManagementInformationSystems(SMIS).Only12.5%oftheschoolsand6.25%indicated that they had 16 – 20 functional computers and over 21 functional computers respectively which were distributed in the offices and the computers laboratory. Majority of the sub county teachers (32%) indicated that the schools they represent have 1 – 5 functional computers,24%have6–10computerswhile16%and8%oftheschoolshave16-20computers and over 21 computers respectively which are found in the offices and in the computer laboratory.

Thecountyschoolsontheotherhandindicatedthat66.67%had1–5functionalcomputers, 17.78% 6 – 10 functional computers, 4.44% and 2.22% of the schools have 16 – 20 and over 21 functional computers respectively. The small percentage of schools with 16 – 20 computers and over 21 computers had distributed the computers to the offices for SMIS and the school laboratories for the purpose of teaching students who had taken computer studies as an elective subject. Majority of the schools had very few functional computers either between 1 – 5 or 6 – 10 which are mostly found in the offices. The overall findings from the principals, sub county secondary school teachers and county school teachers can be summed up in the statement that the functional computers in the secondary schools in Makueni County were very few hence in adequate for teachers to efficiently integrate ICT in the implementation of curriculum since all respondents gave the response that majority of the schools have 1-5 functionalcomputers.

These findings were supported by findings in a study carried out by Vanderlinde and van Braak (2010) in Malaysia on factors that affect the implementation of the technology among the school teachers. The study had found out that, teachers will perceive greater controltoemploytechnologyintoinstructionalusewhentheyhavethenecessaryhardware and software resources. Samuel and Zaitun (2007) researched on the adequacy of ICT resources and the right ICT Skills for teachers in integrating ICT tools in teaching and learning of English Language in Malaysian schools. The survey findings revealed that 81.7% schools have computer laboratories, 64.2% said personal computers are connected to the central server and 48.6% have computers for use. However majority of computer laboratories are inadequate in specifications and quality hence inadequateuse.

The results of the study further indicated that, majority of the principals (50%), sub countyschoolteachers(76%)andcountyschoolteachers(44.4%)accessICTresourcesin the cyber cafés since most schools lacked ICT resources. ICT resources in cyber cafés cannot be used efficiently for ICT integration in curriculum implementation due to challengeoftimefortravellingtothecybercaféandthefactthatteacherscannotborrow the resources to take to school but can only print photographs and diagramswhich is limited due to the cost implication which may not be catered for by the school. The findingsareinlinewithanotherstudycarriedoutbyRichardson(2008)andKatulo(2009) intheirstudiesinNamibiaonICTintegrationwhofoundoutthatinadequateICTresources limit ICTintegration.

In addition, the findings indicated that availability of ICT resources like projectors, internet, printers, computers and source of power influence ICT integration to great extent and to some extent respectively as indicated by Principals (87.5%) and (12.5), sub county teachers (64%) and (12%) and county school teachers (84.4%) and (4.4). Since ICT infrastructure is not well established in most schools in Makuenicounty, ICT integration in curriculum implementation has lagged behind. These findings concur with those of the study done by Cowie and Jones (2005) and Samuel and Zaitun (2007) who researched on influence of ICT infrastructure and influence of ICT resources on ICT integration in Malaysia and found out that ICT integration in curriculum implementation cannot take place efficiently without established ICT infrastructure and adequate ICT resources. The results of the study showed that majority of the sub county teachers (32%) indicated that the schools they representhave1–5functionalcomputers,24%have6 –10computerswhile16%and8% oftheschoolshave16-

20computersandover21computersrespectivelywhicharefound in the offices and in the computerlaboratory.Thecountyschoolsontheotherhandindicatedthat66.67%had1–5functionalcomputers, 17.78% 6 – 10 functional computers, 4.44% and 2.22% of the schools have 16 – 20 and over 21 functional computers respectively. The small percentage of schools with 16 – 20 computers and over 21 computers had distributed the computers to the offices for SMIS and the school laboratories for the purpose of teaching students who have taken computer studies as an elective subject. Majority of the schools had very few functional computers either between 1 – 5 or 6 – 10 which were mostly found in theoffices.

V. CONCLUSIONS

The study established that well developed ICT infrastructure positively influenced ICT integration in implementation of curriculum although in Makueni County Kenya.The situation impedes ICT integration in curriculum implementation as it was established that, most schools had few functional computers in the school and even lacked computer laboratories. Consequently, majority of the principals and teachers accessed ICT resources in the cyber cafes which limited ICT integration in curriculum implementation. ICT infrastructure is a key factor in ICT integration in curriculum implementationbutthroughresponses,itwasfoundthatICTinfrastructureinmostschools was in poor condition since most schools lacked internet connectivity despite the fact that majorityoftherespondentsindicatedthatinternetinfluencedICTintegrationtogreatextent. This situation made teachers to depend on cyber cafes for internet access. Thechallengeasearliernoted is that functional computers are inadequate causing the process of ICT integration in curriculum implementation to be low.

RECOMMENDATIONS

From the findings of the study the researcher recommends that, the Ministry of Education (MOE), through the Department of Early Learning and Basic Education (DELBE) which ismandatedtoprovidebasiceducationtoalldeservingcitizensandtheemployerTeachers Service Commission (TSC) should come up with modalities of implementing the ICT policy in all secondary schools to ensure all teachers in Kenya are trained in ICT skills to beabletointegrateICTincurriculumimplementation.TheemployerTSC,throughTeacher ProfessionalDevelopment(TPD)tocontactgapanalysisandlaunchcountry-widecapacity building to all teachers deficient of ICT skills to enable them institutionalize ICT integration in curriculum implementation in favour of Competence Based Curriculum which aims at developing digital literacy as one of the seven competencies in the 21st century.

REFERENCES

[1]. Akubuilo, D. U., &Ndubuizu, C. L. (2003).Using information and communication technology to enhance learning in schools and colleges.In M. A. G. Alake (Ed.) Proceedings of the 44th annual conference of STAN, p. 80-85

[2]. Bariu, T. N. (2020). Status of ICT Infrustructure Used in Teaching and Learning in Secondary Schools in Meru County, Kenya.European Journal of Interactive Multimedia and Education , 1-8.

[3]. Chapman, D. W., &Mahlck, L. O. (2004).Adapting Technology for School Improvement: A Global Perspective: ERIC.

[4]. Cowie, B., & Jones, A. (2005). Digital horizons: Laptop for teachers evaluation study update onsecondary teacher's experiences. Retrieved October 30, 2007 from http://www.minedu.govt.nz/web/downloadable/ dl8568_v1/laptop-leaders-report- 12-9-with-edits-ds.doc.University of Waikato.

[5]. Elmunsyah, H. (2012). A Study of ICT Infrastructure and Access to Educational Information in the Outskirts of Malang.ActaDidacticaNapocensia, 5(2), 41

[6]. Farrell,G (2007) Survey of ICT And Education In Africa: Kenya Country Report Kenya – 1 www.infodev.org

[7]. Gbadamosi, L. (2000, July). Challenges of e-teaching profession and ways forward: An educational planner`s view. Paper presented at ICT workshop organized by Teachers Registration Council of Nigeria. AdeniranOgunsanya College of Education, Lagos

[8]. Granger C. A., Morbey M.L, Lotherington H., Owston R. D., &Wideman H. H. (2002). Factors Contributing to teachers' successful implementation of IT. Journal of Computer Assisted Learning, 18, 480-488.

[9]. Haggins, C. (2005). Embedding ICT in the Literacy and Numeracy Strategies: Final Report, UK.New York: University of New Castle.

[10]. Kukali, A. N. (2013). Opportunities and challenges for use of Information Communication and Technology in management of public secondary schools in Bungoma South District Kenya. International Journal of Science and Research (IJSR) India online ISSN:231-97064-Volume 2.

[11]. Lowder, S. K., &Regmi, A. (2020).Assessment of outcomes based on the use of PIM-supported foresight modeling work, 2012-2018: Intl Food Policy Res Inst. https://doi.org/10.2499/p15738coll2.133608

[12]. Minishi-Majanja, M. (2007).Integration of ICTs in library and information science education in sub-Saharan Africa. Paper presented at the World Library and Information Congress: 73rd IFLA General Conference and Council.

[13]. Mugenda, A.G. (2011). Social Science Research.Theory and Principles. Nairobi: Applied Research & Training Services Press.

[14]. Ogachi,N.M.(2014).FactorsInfluencingPrincipalsIntegrationofICTinAdministration of Public Secondary Schools in Isinya Sub-county, Kenya.Masters Thesis, Unpublished: University ofNairobi.

[15]. Ogbonnaya,U.I.,2010,'Improvingtheteachingandlearningofparabolicfunctionsbythe use of information and communication technology (ICT)', African Journal of Research in MST Education 14(1), 49–60.

[16]. Pelgrum,J.W.(2005).ICTIntegration,DatafromInternationalCooperativeStudies.New York: EnterpriseInformation.

[17]. Republic of Kenya. (2005). the National ICT Strategy forEducation and Training,Nairobi. Government press.
[18]. Republic of Kenya (2006)"National ICT Policy." 2006. Ministry of Information and Communications. http://www.information.go.ke/docs/ICT%20Policy.pdf 7."Ministry of Education National ICT Strategy for Education and Training."
[19]. Samuel, R. J. &Zaitun, A. B. (2007). Do Teachers have Adequate ICT Resources and the right ICT Skills in Integrating ICT Tools in the Teaching and Learning of English languageInMalaysianSchoolsintheElectronicJournaloninformationsystemsin developing countries 29, 2,pp.1-15.
[20]. Swarts, P. &Wachira, E. M. (2010). ICT in Education Situational Analysis: Global e-schools and communities initiatives. Dar-es-salaam, Tanzania. Retrieved from www.tanzania.go.tz/egov
[21]. UNESCO (2005). Information and Communication Technology in Education: A Curriculum for Schools and a Programme of Teacher Development. Paris, UNESCO.
[22]. Vanderlinde, R., & van Braak, J. (2010).The e-capacity of primary schools: Development of a conceptual model and scale construction from a school improvement perspective. Computers & Education
[23]. Voogt, J., Knezek, G., Cox, M., Knezek, D., & ten Brummelhuis, A. (2013). Under which conditions does ICT have a positive effect on teaching and learning? A call to action.Journal of Computer Assisted Learning, 29(1), 4-14. https://doi.org/10.1111/j.1365-2729.2011.00453.x
[24]. Williams, M. D. (2003). Technology integration in education. In Tan, S.C. & Wong, F.L. (Eds.), Teaching and learning with technology, pp.17-31: An Asia-pacific perspective. Singapore
[25]. WorldBank.(2004). Contributions of ICTs in Economic Growth.Washington DC: The World Bank Institute.