

## Determinants of Efficacious Instructional Technology Implementation in Ethiopian Education: A Systematic Desk-Review

Endalew FufaKufi (Ph.D.)

Arsi University, Ethiopia

**Abstract :** This research investigated efficient use of instructional technology in Ethiopian education. The aim was to substantiate factors hindering cost-effective and proper use of technological resources in Ethiopian education. For that purpose, a systematic desk-review was made on research works held across schools in different corners of the country were selected and revitalized. Situational discourse analysis was used in reviewing the concerned studies. Units of analysis were research findings derived from diverse institutional research works. The revisited findings denoted most of the determinants in selecting and using information and communication technology to have been weak infrastructural supplies, shortage in internet connectivity and low level of preparation in using the technology. Pedagogic non-alignment of the ICT resources, shortage in access to the technology, and fluctuation in electric power, weakness of managerial support and weak collegiality among the staff were found to be pressing determinants of instructional technology implementation. Though the researches were held in different places at varying times, the results indicated individual, institutional, technical and managerial issues as daunting issues on the efficacious use of instructional technology. Reflections have been made on policy and practice-based implications. .

**Key Terms:** Successes; Challenges; Information; Technology; Education

### 1. Introduction

Technology has elevated educational services with the latest information and communication besides improving business altars and alleviating poverty through youth job-creation. Promoting youth employment and employability could be ensured through integrated efforts in the areas of education, skills development and job-supply, and support for low-income entrepreneurs (Sunkara, Tapio&Rao, 2015).

Parallel to the existing prominence, however, there are conditions in which the educated youth are less prepared for the world of work either due to lack of access and proper adaptation of technological resources or reluctance to use technology for the right purpose (Lin, 2007). Though technology provides for potential employment networks that can enhance youth sustainable development, there are socio-

economic barrier, digital skill shortage and maladaptive practices that hinder progressive use of the technology (Alao & Brink, 2020).

It is proven also that, access to technological resources is an essential part of instructional delivery system. In that, proper access and success in technology-use process are believed to have lubricating effects in improving young people's prominence to mobilize, collaborate and respond to social concerns in addition to having access to capital, markets and training opportunities needed to pursue a career (United Nations, 2016; Gray & Lewis, 2021). In addition to direct service in education, technology has proved a systematic tool for virtual development across nations, sectorial inclusivity in development, advances in wealthier, healthier and more productive ties, and production of techno-native youth which can advance democratic governance and productive connectivity in and out of the classrooms (Daniel, 2022). In spite of the positive expectation behind technological resource use in and through education, efficient and ethical use of available resources is seldom researched.

## 2. Theoretical Framework

Researches denote social alienation backed up by internet addiction as found out in a study held on 500 randomly selected students from Shiraz University of Iran where 13.2 percent were so affected (2011). In that, there were psychological injuries emanating from addiction to the net such as loneliness, decrease of self-esteem, unreal world imaginations and widespread range of anti-social behaviors. The same research recommends education for the youth to employ time-control mechanisms. Social supports from parents, caregivers and the community at large are also traced as indispensable. But the study does not touch any internally self-directed and need-based inflections in using information and communication technology.

Problematic uses of ICT in personal and school settings were also reported largely among young users of mobile technology; more specifically smartphones, with top manifestations of wastage in learning time, copying homework from others and getting detracted during lesson times (Rodriguez-Gomez, Castro & Meneses, 2018). This is consonant with Bosamia (2013) who affirmed reduced face-to-face interaction, social disconnection, reduced physical activity leading to health problem, cost of using ICT resources, job-insecurity and loss, and loss of privacy. In the face of technology-use, there are both advantages and disadvantages, as observed in the aforementioned studies.

## 3. Objectives of the Study

The purpose of the study is to identify common determinants of selecting, organizing and implementing information and communication technology resources in an efficient and ethical manner. The study addressed the succeeding questions: What are the practices and challenges of technology-use among youth group in Ethiopia? How

do informal and formal institutions address and handle challenges related to technology-use among the youth at school, at work and among the society? What breakthrough mechanisms could be implied from domestic and international research works ?

#### **4. Methods and Materials**

This study dealt with identifying factors affecting efficient and ethical use of instructional technology in education. The study was based on revisiting research and experiences on ICT use in Ethiopia in the year lapsing from 2013 to 2023 G.C. Contextual discourse analysis of the interpretive, qualitative design was used. In that, systematic desk review (Newman & Gough, 2020; Nunn & Chang, 2020) was held on research works so far held in Ethiopia at different levels. In the selection of the research works, purposive sampling was used, the point in focus being the concentration of the studies on need-based use of the esteemed technology. Units of analysis were purposes, questions addressed, data collected and analyzed, findings and recommendations provided for each case in the studies. Pertinent sources denote that, systematic review, also known as the research synthesis, aims to provide a comprehensive, unbiased synthesis of many relevant studies in a single documents (Aromataris& Pearson, 2014; Pettigrew& Roberts, 2006).

#### **5. Results and Discussion**

In holding this study, core issues related to practices and challenges of technology-use among youth group in Ethiopia were revisited based on existing research findings. . Research on Technology-Use in Ethiopian Tremendous research works have been held regarding ICT integration in to learning and youth development in Ethiopia. One of the research works conducted (Hailye, 2019),focused on challenges in ICT integration in Ethiopian education by taking practice-related issues in selected schools of Southern Ethiopia Region (S.N.N.P.R.). In the broad sense, functioning, tactical and pedagogic challenges were observed. Lack of ICT infrastructure, shortage of qualified teachers and students' lack of interest to learn as well as inadequate information on the practical enforcement of ICT were the triggering factors. The point is that, though the research identified practice-dimensions and challenges faced by teachers and students, it failed to earmark what necessitated the practices and factors that triggered the shortages. Poor access to internet was one of the challenges but the research did not denote why that shortage came about. It may have been related to poor ICT administration, institutional predicament to update the use system or high cost of service. The other factor was poor working condition. Like the internet problem, the working condition in ICT use was the other factor which could jeopardize smooth and strong relationships among teachers and students on vertical and horizontal bases. But the research did not trace the driving factors as to be indicative of the way forward.

Another research, (Hailemariam ,2022) studied the challenges of using ICT among secondary school teachers of Yeka Sub-City, Addis Ababa, and found out inadequate infrastructure, lack of internet connectivity, electric power fluctuation, high cost of hard and software, outdated computers, shortage in computer literacy, shortage in staff collegiality, lack of encouragement for teachers to be professionally strong to have been the challenges. Since the research does not put practice-based issues foremost, it was hard to relate the challenges to any practice events. Amanuel (2019)<sup>3</sup>, exploring the role of ICT for pedagogical practices in higher education in Ethiopia, came up with the findings that, limited infrastructure, users' negative attitude, shortage in management support, human resource skill-shortage, lack of policy support, lack of progressive support and structural misalignment of ICT administration with pedagogic practices. Students' skill-shortage in using ICT for the learning purpose was also the other barrier.

Berhanu (2019)<sup>4</sup> studied means of transforming educational practices of Ethiopia into knowledge society by taking the image in higher education, and identified lack of relevant preparation, lack of well-qualified professionals and shortage in aligning the use of technology with teaching and learning techniques to be traceable barriers.

Temtim, Berhanu and Birara (2021)<sup>5</sup> held a study on ICT integration in Ethiopian high schools and denoted high investment on ICT purchase coupled with short-term training and use. In that, teachers' reluctance to use information and communication resources, shortage of computers and related gadgets, problem in ICT administration, shortage in maintenance support due to shortage in expertise and motivation, connectivity interruption, inadequate teacher-skills both at pre-service and in-service level, less-accessed on-job training for teachers, non-alignment of skill-training to the practices time and situation, and lack of administrative support for teachers due to failure to recognize the benefit ICT has for professional success.

A research held by Addisalem (2020)<sup>6</sup> on factors affecting the use of ICT services in Illubabor Zone identified lack of training for the working staff and insufficiency of ICT-related budget for proper provision of services to be the dominant factors pulling services back. Roman and Harpriya (2021)<sup>7</sup> studied factors affecting the use of ICT secondary schools of Kolfe-Keraneo of Addis Ababa City Administration in which they identified inadequate infrastructure, power outages, internet outages, inadequate computer supplies, lack of technical support, lack of ICT skills training, teachers' lack of skills to teach and work with computers, lack of entry skills for teachers and students and lack of attention on the part of hosting schools to ICT education overall.

Bekalu, Elen, Van Petegen, Adula and Goemen (2021)<sup>8</sup> surveyed determinants of instructors' educational ICT use in Ethiopian higher education, and came up with four categories of determinants which had attributes in individual (skill competencies and

attitudes); institutional (ICT-related vision, plan, professional development, management support and technical support); infrastructure-related (internet connectivity, ICT equipment, electricity-power and classroom setup), and course nature and the encompassed subject matter.

Abraham and Achamyeleh (2018), held a study on factors affecting teachers' ICT-use for instructional purposes by taking the case of schools in Southern Gondar, Amhara Region, and came up with the findings that, access to ICT resources, school ICT policy, alignment of ICT to school curricula and teachers' perceptions about the use of ICT in providing lessons to have been the successively daunting factors. Here, both institutional and individual determinants were subsequently manifest as determinants.

Solomon and Yilfashewa (2022) held a study on Status of ICT Integration in Secondary Schools of Dire Dawa, and came up with the findings that, lack of training and technical knowledge, the high cost of technological devices and internet service, and a lack of internet connectivity were major challenges. A shortage of computers in private schools and a lack of enthusiasm in government secondary schools were particular problems as well.

## 6. Summary of Findings

The use of ICT for instructional purposes across the education of the youth for proper and sustainable development needs due care and support. For due care and support, it has become duly important to revisit and reflect research findings on ICT use in education across Ethiopia. In the above research-based survey, studies held regarding ICT use in education in Ethiopia from north to south regions, and from east to west were concerned. Some studies from the central part of the country were also revisited. On the basis of the research-based presentation and reflections made on the findings, the succeeding determinants were identified as per the researchers so far held in line with issues concern at large:

No.	Factors Researched	Categories	Indicators	
			No.	%
1.	Infrastructure	Institutional	8	80%
2.	Training and Preparation	Institutional	6	60%
3.	Budget	Institutional	3	30%
4.	Pedagogic alignment	Professional	6	60%
5.	Policy Guide	Institutional	3	30%
6.	Internet Connectivity	Institutional	8	80%
7.	Staff Qualification	Professional	3	30%
8.	Cost of hard and software	Institutional	3	30%

9.	Staff collegiality	Individual	4	40%
10.	Interest to use ICT	Individual	8	80%
11.	Power supply	Technical	4	40%
12.	Access to ICT resources	Institutional	7	70%
13.	ICT Plan	Institutional	3	30%
14.	Management support	Managerial	2	20%
15.	In-service Induction	Institutional	2	20%

Table 1. Categories of Determinants Observed in Current Research on ICT.

As indicated in **Table 1** above the categories of determinants on ICT use in the instructional process included institutional, managerial, professional and individual factors. In line with their distribution in the research works so far assessed, shortage in infrastructure, internet connectivity and interest to use the available resource for the right purpose constituted the largest and greatest part (8, 80%) whereas lack of preparation (8, 80%) and pedagogic non-alignment of ICT provision constituted the third determinant in prevalence (6, 60%).

Shortage in access to ICT resources was indicated to be a striking (the fourth) problem of concern in 5 (50%) of the research cases assessed where as shortage in managerial support, failure in electric power supply and reluctance in managerial support constituted the fifth (4, 40%). Less in significance were budget, rising cost of soft and hard ware and ICT Policy (3, 30%) whereas the least significant as the studies denoted were issues of shortage in budget and institutional plan (2, 20%).

Overall, researches have indicated the arrangement and supply of ICT infrastructure in due quantity and quality to be the foremost point of consideration in the education of the youth. Perhaps, providing for entry and in-service skills to apply ICT in education plus pedagogic alignment of ICT to the nature of courses and lessons provided remains to be very essential for the success of the vested technology use in education. Most of the researchers studied access to technology, just the second point next to availability, which constituted the fourth issue of concern. Usability issue could have been very much essential as per the nature of courses and professional competences of teachers. However, that part was not traced in almost all studies assessed.

## 7. Conclusions and Implications

In relation to the provision for youth learning through ICT, this research looked into the relationship between youth learning needs and institutional provisions in terms of practices and challenges. Most researches indicated negative relations to have existed between institutional supplies and learning demands in terms of infrastructure and facilitative services. Entry skills and in-service training were also traced to be indispensable but the findings highly focused on informative, cognitive and implicational aspects rather than psychological or ethical aspects.



Attention to pedagogic alignment was said essential with respect to ICT use in the instructional process but the role of educational stakeholders from policy to practice was not pointed out by far. So, further research is required on holistic analysis of the role of ICT in education from human development, comprehensive use the resources and ethical implementation at large.

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