An Empirical Review of Role of Education Technology Drivers (EDUTECH) on Education in Emergencies (EiE) Classroom/Non-Classroom Outcomes for Marginalized Countries: The Somalia Perspective

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Abstract

Purpose: The aim of this essay is to provide a desktop review of existing empirical evidence themes on the necessity and use of education technology for continuity of education in emergencies (EiE) in marginalized countries. The essay aims to provide a summary into how EDUTECH can be leveraged to maintain continuity of education for most marginalized regions in Somalia.

Methodology: The empirical review methodology of this essay was borrowed from the Cochrane collaboration rapid assessments framework (Garrittyet al., 2020). The researcher adopted this methodology because it allows for a rigor filled and systemic technique while allowing the scoping narrow enough in a short time, necessary for this assignment

Results: A focus on Emergencies (EiE) settings dependent on EDUTECH adoption variable encompassed a cycle of anticipation, response, and recovery on the tenets of how education technology drivers can be harnessed to emancipate Education in Emergencies (EiE) delivery in marginalized areas within Somalia.

Unique Contribution to Theory, Policy and Practice: Technology can be leveraged to coordinate and efficacy of response efforts. In this setting, the employment of technology to assist with data collection is critical. Digital data gathering can be vital for informing institutional-level monitoring of students' and schools' performance, impacting broader educational policy planning, and recognizing essential education requirements during times of emergency. When considering the expansion of EdTech in times of crisis, data safety and safeguarding must be prioritized.

Keywords: *Education Technology Drivers (EDUTECH), Education in Emergencies (EiE), Classroom/Non-Classroom Outcomes, Marginalized Countries*

Introduction

Menendez et al. (2016) opine that in response to education in emergency constraints, a body of evidence in various international humanitarian theoretical precepts has recommended a broad faceted response of tactics, strategies, and theories to enable continuity of holistic education sustainability in emergencies situations. This is informed by the increased significant student disruption risk during this period in history (Corona virus, terrorism, internal strife, resources etc.) (GCPEA,2020). Research also reveals that while learning is affected by emergencies, continuing learning is adversely affected as the attention is transferred to newer disruptions of education (Pheraliet,2016). Further, in agreement with Pheraliet (2016), GCPEA (2020) speaks on intersecting Education in Emergencies (EiE) posed by emerging risks; contagious ailments such as Covid-19, which has affected 3 out of four children globally. Covid-19 effects translate to a staggering 104 million children.

Alfarah and Bosco (2016) opine that the use of technology in access to education pedagogy within and off learning environments before and after emergencies is well documented. The authors posit that education technology is beneficial as it is instrumental in building competencies, especially in emergencies pertaining to overcoming the safety and security of marginalized learners. Additionally, edutech technology can bridge the gap of education provision on the grounds of institutional impairment, recovering from emergencies. Burde et al., (2011) argues that 'edutech' emphasizes delivering education in a 'packaged; way, signifying compatibility of education as other types of packaged assistance. It helps dismantle education's long-held view as an intersection of politics. Tauson and standard (2018) note that Education continuity and contextualization provided by Education Tech in most of the literature emphasizes the critical nature of educational technology during times of disruption induced by emergencies. Ashlee et al. (2020) argues that edutech bridges human resource/staff in induced by emergencies. Winarni et al. (2018) summarizes edutech into various categories depending on various functions: technology in learning, or data collection, or use of the technology to monitor the emerging emergencies. Ashlee et al (2020) defined edutech through;1) facilitation of access to education and learning through the use of technology, (2) education and content pedagogy during and after emergency, (3) support of education drivers and actors through technology, (4) protection and wellbeing of learners in risky contexts.

In Somalia, Classroom and non-classroom Education in emergencies disruptors conceptualizations includes: weakening of drivers of education such as government and private origination constructs, risks which break that disrupt tangible drivers of education such as schools, school infrastructure, loss of quality education due to issues of funding, pedagogy mismatch, human resource redundancy among others (Nicolai & Hine, 2015).

Figure 1 below illustrates a summarized macro and micro view of (EiE) disruptors prevalent in marginalized regions in Somalia that may affect continuity of education.
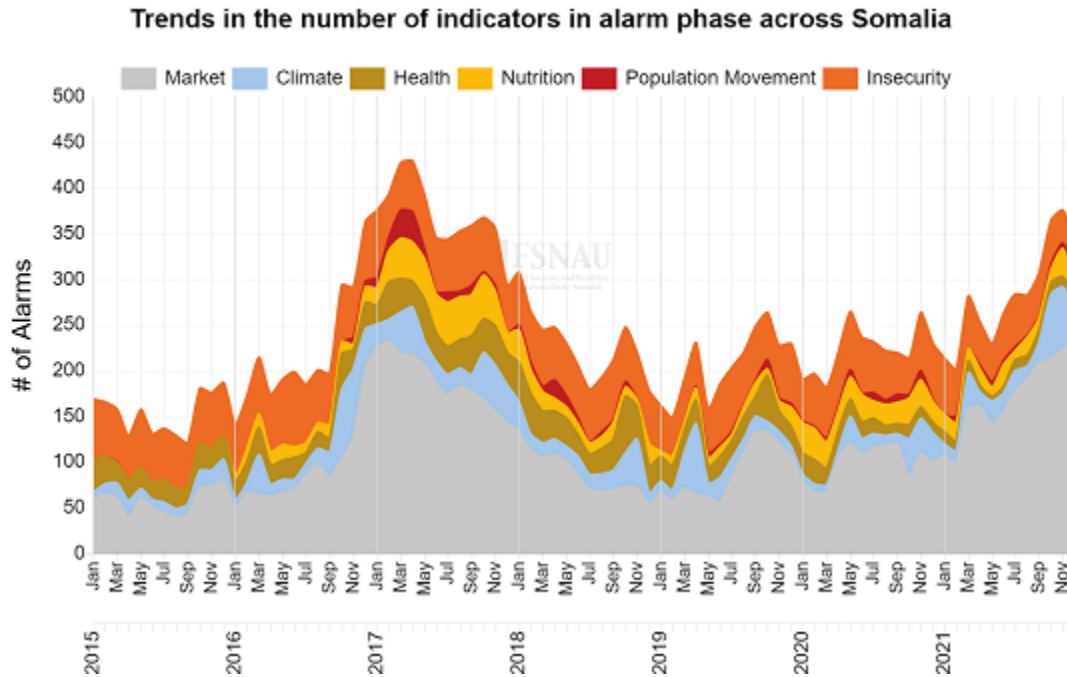
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Figure 1: Somali Classroom Education in Emergencies (Credit fsnau.org,2021)

Somalia

Somali is located in the horn of East Africa.Datareportal.com (2021) gives the population of Somalia as 16.2 million as of January 2021. The population demographics translates into 50.1 % female and 49.9% male. Extended drought causalities in 2022 are projected to hit 4.5 million casualties (FSNAU,2021). In justifying the choice of the scope of study, role of education technology drivers and Classroom Education in Emergencies outcomes in the republic of Somalia), the essay argues that due to the nature of Somalia emergency indicators as shown in table 1, it is prudent to provide a summary into how edutech can be leveraged to maintain continuity of education for most marginalized regions in Somalia (Buehren et al.,2017).

Table 1: Non classroom Education in Emergencies (EiE) in Somalia(unicef.org 2021)

Fact	Variable	Explanation
Education Phases	5	Primary (grade1-4) Middle (grade 5-8) Secondary (grade 9-12) Vocational/technical (age 15-18)

		Tertiary/higher education.
Mode of delivery	More of oratory than scripted	Adopted Latin script by 1972
Enrollment ratio	Lowest in the region	42%(1.5 million Somali population out of school) Covid-19 affected over 800,000
Funding	50 million dollars as of 2019	Majority funding by external donors
Strategic learning	*Bar Ama Baro system* (learn or teach in Somali)	Inclusion of both Somali non-Somali cultural teaching
Education in emergency settings	Objectives	Improve access to learning Global partnership funding Technology adoption Transforming lives
internet connectivity	1.95 million users by Jan 2021	Internet connectivity 12.1%

Problem

A peek into Somalia's current status (see figure 1 above) reveals a country facing a barrage of emergencies (FSNAU,2021; OECD 2015; Unicef,2016 ibid,). Statistics given by World bank (2021) reveal that the 16 million rich population country consists of 6 million youth (53%) ranked under 18 years. Enrollment ratio in Somalia is lowest in the East African region whereby 42%(1.5 million Somali population out of school. Covid-19 affected over 800,000 learners. Additionally, 1.8 million (18. 2%) citizens are under five years. Somalian Adolescents' age bracket of 10-19 years is 24% and expected to grow highlighting need for education continuity (USAID,2017). Non class factors such as social exclusion, social strife, aggravated inequities, especially of majority Somalian pastoral communities ransacking the Somalian social fabric also postulates a threat to education continuity. Geographic access Impediments, living and surviving in problematic areas, pockets of disadvantaged personas in urban settings with low internet penetration contributes to education discontinuity. The problem is compounded by the state of the ever-increasing scourge of IDPs annually forcing learners to be affected (MoEHS,2016). Other conflict settings, refugee

crises, epidemics, natural disasters, civil war in Somalia pose a security risk for learners and teachers' epidemics (Bandiera et al., 2017). These set of Education in Emergencies risks propagates the need for an empirical review of existing empirical evidence on the necessity and use of education technology   for continuity of   education in emergencies(EiE) in marginalized third world countries.

Purpose

The aim of this essay are to provide a desktop review of existing empirical evidence themes on the necessity and use of education technology   for continuity of   education in emergencies(EiE) in marginalized countries. The essay aims to provide a summary into how edutech can be leveraged to maintain continuity of education for most marginalized regions in Somalia.

Research questions

1. What are the key emerging themes on adoption of Role of Education Technology Drivers and Education in Emergencies outcomes?
2. What are the key findings that can be drawn to inform on effective Education Technology Drivers in promoting effective Classroom Education in Emergencies outcomes?

Justification

This essay underscores the role of the urgency of Education technology adoption in Education in Emergencies outcomes. A focus on Education technology adoption education which encompass a cycle of anticipation, response, and recovery can be harnessed to emancipate state of Education continuity in Emergencies education delivery in marginalized Somalia (WCW,2018).

Theoretical perspective

Theory of Change

This essay's theoretical perspective is embedded in the contemporary theory of change that has been in use for several decades. Gaining popularity in the 2000s and pioneered by non-governmental policy heads such as the UN and other humanitarian groups, this theory argues that education in emergencies situations should be defined as an independent spectrum of discipline different from development paradigms that incorporate educational in conservative humanitarian assistance (Burde et al., 2011). In linking role edutech drivers with change theory, this essay underscores the role of the urgency of technology that emphasizes delivering education in a 'packaged; way, signifying compatibility of education as other types of packaged assistance (Gladwell & Tanner (2014)). By building a hypothetical framework around the change theory assumptions, the essay hopes to develop an(EiE) results structure framework that is centered on education continuity sustainability.

Theme identification

In conceptualizing the study themes of Role of Education Technology Drivers ON Education in Emergencies (EiE), the essay referred to (INEE, 2012), who states that an Education in Emergencies(EiE) under the international humanitarian paradigm is a situation that disrupts the functionality of a community and has not yet been resolved. A focus on Emergencies(EiE) settings dependent on edutech adoption variable encompassed a cycle of anticipation, response, and recovery on the tenets of how education technology drivers can be harnessed to emancipate Education in Emergencies(EiE) delivery in marginalized areas within Somalia.

Methodology

The empirical review methodology of this essay was borrowed from the Cochrane collaboration rapid assessments framework (Garrittyet al., 2020). The researcher adopted this methodology because it allows for a rigor filled and systemic technique while allowing the scoping narrow enough in a short time, necessary for this assignment. Specific areas of empirical interest that the author screened was how Education Technology Drivers influenced (EiE) discontinuity through; Inequalities in education, education exclusion, strategies, quality of education determinants and retention, pedagogy delivery and stakeholders. These factors were summarized into in four themes (1) edutech facilitation of access to education and learning through the use of technology, (2) edutech education and content pedagogy (3) edutech support of education drivers and actors through technology, (4) edutech protection and wellbeing of learners.

Empirical review

Facilitating educational and learning access

Alfarah and Bosco (2016) opine that the use of technology in access to education pedagogy before and after emergencies was necessarily for academic discourse. Leveraging technology is instrumental in building competencies, especially in emergencies pertaining to overcoming the safety and security of marginalized learners. Additionally, the leverage of technology can bridge the gap of education provision on the grounds of institutional impairment, recovering from emergencies. The literature study confirms the conclusion of a systematic review conducted by Dahya and Dryden-Peterson (2017), who found out that technology leverage in Somalia should focus on long-term educational goal sets executed in post-emergency settings. However, Tauson and standard (2018) are of the opposing view suggesting that leverage of education technology in emergency settings should be structured in a way that its utility is harnessed within the time frame of the emergency. This is aimed at filling the 'disturbance' of the emergency. The empirical evidence of this study focused on learners' experiences beyond the classroom setting.

Carlson (2013) supports broadcast education technology aimed at the provision of educational access in non-enclosed environments, particularly in emergency settings. The author opines that Radio broadcast is frequently used in the provision of educational access in non-enclosed environments However, while numerous examples of programs are cited in his study, there is scant

information regarding their usefulness or impact as a medium of education transfer. Dahya (2016), disputing Carlson (2013), provides broadcast education technology efficiency. In his paper, he cites the radio broadcast offers in Somalia connoted as a Somali interactive radio instruction program during 2005 and 2011 during a volatile moment of Somalian history. Earmarking its success, the study found that use of radio technology alleviated the 'disastrous storm 'for education delivery. Somali interactive radio instruction program made use of radio   broadcast technology to offer youngsters with education impartation that would not have been possible via more traditional channels of instruction. This educational access was made possible through formal and informal schooling venues, as well as through home surroundings (Dahya, 2016).

 Both Dahya, (2016) and Carlson (2013) offers glimpses on the risk of overuse of education technology. For instance, Dahya (2016) maintains that radio technology's success in emergencies intersects many factors and is thus not fully reliable. In light of the 'security emergencies environment, the author notes that available internet connectivity, inconsistent electrical supply, insufficient local experience for developing contextually relevant education content, and weak institutional capacity, among other issues' may incapacitate Facilitating educational and learning access. Addtionally, Carlson (2013) highlighted that Ustad Mobile, as a company that leverages mobile technology to engage students in learning in Afghanistan, little evidence of student learning was available to justify successful Facilitating educational and learning access.

Education pedagogical content

Tauson and standard (2018) noted that Education continuity and contextualization provided by Education Tech in most of the literature emphasizes the critical nature of educational sustainability during times of disruption induced by emergencies. The emphasis did not rely on retaining children in school but further on preserving the learner's identity in the face of other identity disruptions (Tauson & Stannard, 2018).

Morris and Farrel (2020) underlined the significance of customizing and adjusting Education Tech efforts in the context of socio-cultural implementations frameworks by alluding that no remote learning structure is dependable for imparting education and pedagogy perfectly, especially in emergency settings. Throughout the paper, the authors suggest that Curricula review was a critical factor to evaluate. Tauson and standard (2018) also agree that Education pedagogical content should be cognizant of Curricula review as a critical factor. In essence, Curricula review and alignment should be formulated in response to reflect the local context in emergency settings. In allusion to the Education pedagogical content doctoring, the authors highlighted the successful example of ELs and the education pedagogical content model piloted in southern Sudan.

Successful interpretation of the ELS (English learning school) program for graders 1,2,3 led to its official incorporation. Further evidence, though, shows that even if stakeholder partnerships in education pedagogical content modeling is fast catching phase, mismatch in education ministries guidelines, tv, and radio management has led to a mismatch in Education pedagogical content

outcomes. The continuity of Education pedagogical content was further jeopardized by nonadherence of laid down accredited educational programs and education pathways (Wu, 2020).

Support of Education Drivers and Actors Through Technology

Ashlee et al. (2020) note that emergency settings premeditated or spontaneous have resulted in human resource disruptions in education in an emergencies context. Although available evidence of education technology leverage by educators in terms of staff training, professional teacher development was evident in refugee settings, some instances of nonemergency leverage of education technology by educators also existed. In Iraq, evidence of Edu tech's leverage in building staff experiences in the wake of a protracted crisis existed. Complicated architectural technologies such as cloud, remote learning, learning aids were used in providing teachers with enabled skills and aids(Chinen & Elmeski, 2016).

Chinen & Elmeski (2016) casts doubt on the role of technology assistive capabilities within existing organizational frameworks that enhances education, raising concerns about the validity of education technology associated with precarious circumstances. For instance, studies in Uganda conducted by UNICEF's PBEA program demonstrated the role of educator technology partnership post-conflict situation. Following teacher training and sensitization on conflict, gender roles, and peace initiatives, SMS was sued to remind the educators on planned meetings, materials taught, and feedback on course objectives. However, the pilot study found that SMS messaging did not correlate with expected teachers' instruction outcomes.

Protection and wellbeing of learners in risky contexts.

Afarah and Bosco (2016) note that Risk mitigation in times of conflict is paramount during the acute phase of a conflict, and quick, correct information can be lifesaving. In more general combat situations, authorities deploy message systems to alert the populace when an attack is imminent (Souktel and UNESCO have created a comparable SMS alert system for schools. The concept, which began in Gaza and was later expanded to Syria, enabled specified school officials to alert parents and kids through SMS to threats probable within the institution precincts and alert relevant emergency services.

Building on Afarah and Bosco's (2016) study still on emergency case mitigation by deploying technology. Al hamadayaet al., (2015, p.30) noted that SMS deployment led to successful school in the Gaza program evacuations and aversions during times of armed conflict. There are, however, a number of identified issues with this SMS alert system. To begin, while encryption was vital to prevent the system from being hijacked, it required schools to have qualified employees who could operate the system. As a result, high personnel turnover was identified as a barrier to the project's effective operation. Another underlying issue mentioned was intermittent energy and fuel supply, which led to difficulty accessing the internet and computers required to call parents (Afarah and Bosco, 2016).

Barry and Newby (2012) suggested that learners' protection and wellbeing of learners in risky contexts could be enhanced by using open-source software that weer more superior to existing programs such as UNESCO and Souktel's offline SMS alert system. The authors revealed that open source software benefits included ease of implementation and cost-effectiveness. However, the authors cautioned that in the absence of sufficient data, the help of this system to communities remains unknown.

Winarni et al. (2018) acknowledged evidence that, according to the literature, schools are crucial for encouraging children's engagement and familiarizing with emergency contexts and that technology-enhanced emergency risk education is a good participatory and student-centered approach to learning. Children were educated about catastrophe hazards through the initiatives examined in this literature via games, mobile applications, animations, and films. A unique advantage of utilizing EdTech for disaster preparedness recognized in the literature is its capacity to clearly and graphically demonstrate to youngsters, via multimedia and animations, what they should do in the event of a disaster. This was discovered to be advantageous in pupils' comprehension of emergency risks. Winarni et al. (2018) acknowledged the usage of online digital games as being particularly promising, albeit they provided little insight into why this modality is so fortunate (Sejati et al., 2019).

Conclusions

The essay aimed to provide a summary into how edutech can be leveraged to maintain continuity of education for most marginalized regions in Somalia. The review concluded that education technology accelerated student retention and enrollment during prior and post-emergency settings. Further, in reverence to empirical evidence, this essay acknowledged the role of radio, tablets, and other devices ass education technology in emergencies valid for the Somalian case. The leverage of technology in the Somalian emergency context is critical in communicating crucial information to stakeholders on learners' transitions following emergencies.

Recommendations

- ✓ It is critical that contextualized education and pedagogical content be made in the eyes of different stakeholders. During the conflict, war, hunger as occasioned in Somalia, emergency sensitive and culturally correct education and pedagogical content should be formulated to ensure peace perpetuation instead of conflict.
- ✓ Models that propose blended methods emphasize interactions and relationships with learners and teachers, optimizing self-directed approaches to achieve beneficial education outcomes in emergency settings. Secondly, pedagogical content creation emphasizes delivering education in a 'packaged; way, signifying compatibility of education as other types of packaged assistance.
- ✓ Facilitators should not be left behind in utilizing and adopting technology without sabotaging the education technologies. There are case studies that reveal educators' benefit

from technology in terms of professional development. Scanty evidence shows these case studies' successful outcomes can be used in cross-cultural settings.
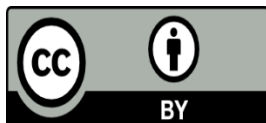
✓ Finally, technology can be leveraged to coordinate and efficacy of response efforts. In this setting, the employment of technology to assist with data collection is critical. Digital data gathering can be vital for informing institutional-level monitoring of students' and schools' performance, impacting broader educational policy planning, and recognizing essential education requirements during times of emergency.

✓ When considering the expansion of EdTech in times of crisis, data safety and safeguarding must be prioritized. The literature review indicates how technology can protect children from emergency-related hazards.

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