

# The Multinational Telecommunication Companies as a Moderator to Achieve Sustainable Development Considering Standard of Living and Digital Education in Sri Lanka

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**Abstract:-** In Sri Lanka, Sustainable Development cannot be achieved on its own and needs mutual Cooperation and partnership. With the COVID -19 and current economic crisis the sectors that contributed the lion share to the economy and employment such as export industries, apparel industry, were badly affected. In this regard, the telecommunication industry plays a vital role of a country. It is not only contributing to economic growth, but it is also an important platform for sustainable development by in offering innovative solutions to overcome environmental and social challenges. Currently, there are six international mobile operators in Sri Lanka. In the present study the researcher identified that even though the telecommunication industry has contributed to sustainable development it has not been carried out to evaluate their contribution on standard of living and digital education initiatives in Sri Lankan context. The researchers studied how multinational telecommunication companies contributed to sustainable development in Sri Lanka, focusing on standard of living and digital education. Also, explored the other possible existing barriers to telecommunication companies in Sri Lanka. Therefore, the research approach of this study was deductive since the researchers attempted to arrive at the conclusions based on the hypothesis by preparing a questionnaire under the quantitative research method. It was distributed among 500 students including high school students, undergraduates, and postgraduates. Subsequent to the analysis of collected data it was found that standard of living and digital education had a positive relationship on sustainable development. Furthermore, telecommunication industry can positively impact as a moderator on those initiatives and achieve a sustainable development in Sri Lanka also identified the effects it will have on society and the companies in Sri Lanka.

**Keywords:-** Telecommunication Industry, Sustainable Development, Standard of Living, Digital Education.

## I. INTRODUCTION

The present economic crisis in Sri Lanka has given rise to a variety of problems on the national level. According to the findings of research that was conducted in 2022 by Vivekanantharasa and Blanco [24] the infrastructure of higher education including teaching and learning, funding, facilities, and access, have been significantly harmed, which has resulted in a great deal of future uncertainty. The current state of the economy has led to a shortage of both physical classroom space and internet connectivity for distance learning, which has the effect of making it more difficult for people to pursue higher education. In reference to standard of living, the majority of Sri Lankans are now unable to travel because of the extraordinary rise in the price of fuel. In contrast, due to the recent economic crisis, there has been a decrease in these. Sri Lanka's economy is struggling under the weight of acute foreign currency shortages, the impending repayment of debt, excessive inflation, and food, fuel, and medication shortages. Higher education institutions, including universities, colleges of education, technical colleges, advanced technology institutes, and vocational education centres, have been impacted in unprecedented ways.

In an effort to bring down Sri Lanka's massive trade deficit, the country's government has temporarily halted all international transactions, including imports and exports. As a result, academic institutions lack the necessary supplies and equipment. Students have been negatively impacted as a result of the spiralling expenses of necessities such as food, medicine, housing, and transportation. Students who want to further their education but can only afford to attend one of the few private higher education institutions in the nation confront a number of challenges as a direct result of the significant rise in tuition costs. A lack of foreign currency and the depreciation of the Sri Lankan rupee have had a negative impact on students from Sri Lanka who are studying abroad. As a result of declining enrollment, several private colleges may be forced to close, and the cost of travelling internationally may become unaffordable for many citizens [24].

After schools and universities were closed for more than a year because of the COVID-19 pandemic, universities resumed limited learning activities until February 2023, pending compliance with health regulations. However, the economic crisis compelled all colleges, universities, and other higher education institutions to reopen and continue operations online. This is a significant disadvantage for a country with a lower-middle income because distant students are unable to commute to school. Accessibility of online instruction and study. Insufficient internet connectivity, unstable electrical infrastructures, and a lack of device access are among the most significant obstacles. In a country where more than 70 percent of students lack access to the internet or electronic devices, online education is not a viable option. In addition, network access was frequently disrupted due to a lack of petroleum which led to longer power cuts.

The current administration was overthrown by a public movement led by educators and students in Sri Lanka during a severe economic crisis and political turmoil. After a new president and transitional administration are elected, action to help the nation recover from the epidemic and economic crisis will be decided. The existing atmosphere threatens private higher education and other industries. Except for the wealthy, Sri Lankan students are expected to suffer, maybe ending their study. Digitalization and new technology in higher education management are needed to create lasting economic, social, and political solutions [24]. However, this transformation may face challenges. In 2019, the Computer Literacy Survey [8] found that 22.2% of Sri Lankan families had a desktop or laptop. The breakdown is 38.3% for metropolitan areas, 19.9% for rural areas, and 3.8% for estate regions. Smartphone use may be limited in isolated rural areas with poor broadband internet infrastructure and little statistics on economically disadvantaged smartphone users. Sri Lanka can boost economic mobility by expanding digital infrastructure access [8]. Telecommunications firms are crucial to sustainable growth, thus they must be recognized to guarantee widespread distribution of new possibilities' benefits. Investments in digital education are important to reap these benefits.

In Sri Lanka, the telecommunication sector is one of the country's most dynamic sectors, contributing significantly, both directly and indirectly, to investment, employment, productivity, innovation, and overall economic growth. Its multinational companies contribute to the country and utilize a large number of resources. In Sri Lanka the telecommunication market is overloaded, with mobile operators serving a population of 22 million. The telecom sector in Sri Lanka is also responsible for substantial Foreign Direct Investment (FDI). The usage of telecommunication has been rising at an alarming rate, and the total fixed lines and the density of mobile telephones have increased mostly by an increase in mobile subscribers [9].

The telecommunication industry consists of digital infrastructure (such as fibre, telecommunication towers, active networks, and data centres), operators (mobile and fixed broadband, data centres, and cloud computing), and applications (broadband connections, telephone, video, e-

commerce, and others). This sector holds promising opportunities for private investors. It has been contributing to economic and social development for more than two decades by fetching connectivity into the palms of our hands. As the primary means of accessing the internet for billions of people, telecommunication is a main platform for economic development, financial inclusion, better healthcare and education, and many other life enhancing services. Mobile connectivity is also fuelling the digital transformation of enterprises and fostering innovative solutions to support the transition to a low-carbon economy according to Groupe Speciale Mobile Association [10].

Sri Lanka's information technology and business process outsourcing sector tripled exports and doubled the workforce from 2015 to 2020. The sector grew by 120 % during this period with current exports at over USD 1 billion, making it one of the highest growth areas in the economy and the fifth largest export segment. Sri Lanka's IT/business process management sector predicted USD 5 billion in revenue, 200,000 direct jobs, and 1,000 start-ups by 2022 [9]. According to the International Telecommunication Union (ITU) [20] it is a major contributor to the economy and plays a major role in society. It facilitates communication among and between people and organisations. The sustainability in the telecommunication industry is highlighted by the ITU stating that there is a direct correlation between a national economy's telecommunication penetration and the rate of growth of GDP [18]. In sharp contrast to many other industries, the telecommunication sector has been generally exempted from major COVID-19-related restrictions, such as stay-at-home orders and quarantine requirements since it is recognized as an essential service.

Currently, there are six international telecommunication operators with license in Sri Lanka: Dialog Axiata, SLT's Mobitel, Hutch, and Airtel, Lanka Bell, and TATA communications. Sri Lanka's telecommunication sector remains elevated by surging mobile and data demand, rising purchasing power and growing consumer preference for smartphones, which have created a positive growth forecast for the industry. Among these companies only Dialog Axiata PLC and SLT PLC are authorized to provide International Telecommunication Services under their main licence of Section 17 of the Sri Lanka Telecommunications Act No 25 of 1991 as amended. At present Dialog has become a pioneering technology provider, not just for Sri Lanka but even within the South Asian market.

Despite having a large number of companies, it was observed that there is only a limited number of studies had been conducted to assess the impact of the telecommunication companies contributions towards sustainability in Sri Lanka. The findings of the previous studies were not 100% replicable in the present context. While it is true that there may have been multiple studies conducted in other countries, it is important to acknowledge that replicating these studies in our own cultural, contextual, and political setting may not be straightforward. The differences in these factors might pose challenges and may prevent a direct replication of the current study. Although,

there have been some studies conducted on the subject, particularly in the setting of Sri Lanka. However, there is inconsistency in the obtained results. In order to address this issue it is essential to do a novel investigation. Therefore, the purpose of the current study was planned to observe the impact of telecommunication companies as a moderator on Digital Education and Standard of Living in Sri Lanka.

In the present study the researcher identified that even though the telecommunication industry has a significant positive influence on sustainable development limited studies has been carried out recently to evaluate their contribution as a moderator on Standard of Living and Digital Education initiatives in Sri Lanka. Also, the researchers intend to examine how telecommunication companies can help to overcome with current challenges to achieve sustainable development in Sri Lanka. Therefore, the overall aim of this study is to examine the telecommunication industry companies' contributions as moderator on Digital Education and Standard of Living and its consequences on Sustainable Development in Sri Lanka.

## II. LITERATURE REVIEW

### ➤ *Telecommunication Companies' Impact on Standard of Living*

The study conducted by Schulz and researchers [19]. shown that the utilization may provide both advantageous and detrimental outcomes for individuals' well-being. For example, the use of information and communication technologies has the potential to enhance social relationships and provide individuals with access to health-related information. However, it is important to acknowledge that these technologies can also contribute to addictive behaviors and interpersonal stress. The researchers undertook a comprehensive evaluation of existing literature in order to examine the impact of information and communication technology (ICT) on subjective well-being and happiness. The researchers conducted a comprehensive search across various databases to identify a selection of publications published throughout the timeframe of 2010 to 2020, which were subsequently incorporated into their literature evaluation. The researchers utilized a narrative synthesis approach to examine the articles and discern recurring themes and patterns in the results. The authors present an extensive literature analysis about the impact of information and communication technology (ICT) on well-being. It is observed that a significant number of the research analyzed in the review exhibited methodological shortcomings or had inconclusive findings. Further investigation could be conducted to address these limitations and generate more definitive results pertaining to the correlation between the utilization of Information and Communication Technology (ICT) and subjective well-being.

Zeng and Wen [26] discovered that the implementation of 5G technology holds promise in terms of fostering creativity, boosting productivity, and improving overall quality of life. However, it is important to acknowledge that the deployment of 5G is not devoid of obstacles and potential hazards. It is advised that policymakers carefully evaluate

these hazards and develop appropriate solutions for their reduction. In order to examine the effects of 5G technology on both economic growth and social welfare, a comprehensive analysis was undertaken by the authors through a study of existing literature. The researchers conducted a comprehensive search across various databases to retrieve publications published throughout the timeframe of 2010 to 2020. Subsequently, they successfully found a number of articles that were deemed relevant for their literature evaluation. To facilitate the examination of the articles and discern recurring themes and patterns in the outcomes, a narrative synthesis approach was adopted. The authors delineate several possible advantages associated with the implementation of 5G technology. However, they also acknowledge the presence of various uncertainties and barriers that hinder its widespread adoption. This inquiry pertains to the strategies for mitigating the aforementioned obstacles and optimizing the prospective advantages of 5G technology in the context of future research endeavors .

Albarracin and Reardon [2]. found that the digital divide amplifies pre-existing inequalities, particularly in relation to socioeconomic status, educational attainment, and health outcomes. The authors propose that the implementation of policies aimed at narrowing the gap, such as the expansion of broadband accessibility and the promotion of digital literacy, can have favorable outcomes in terms of individuals' quality of life. The researchers conducted a comprehensive analysis of existing literature to investigate the impact of the digital divide on both economic and social consequences. The researchers conducted a comprehensive search across various databases to retrieve articles published throughout the timeframe of 2010 to 2020. Subsequently, they identified a number of articles that were deemed relevant for inclusion in their review. The researchers utilized a narrative synthesis approach to examine the articles and discern recurring themes and patterns in the results. The authors emphasized the adverse impacts of the digital gap on both economic and social outcomes, while also acknowledging the limited amount of information available regarding the effectiveness of measures aimed at reducing this divide. Furthermore, it is worth investigating the impact of particular policies, such as governmental subsidies or collaborations between public and private sectors, on reducing the digital divide and improving overall quality of life.

In a recent study conducted by Kim and Lee [15] have observed that the influence of the communications industry on income disparity in developed nations is characterized by a positive relationship, while in developing nations, it exhibits a negative relationship. This observation suggests that the impact of ICT on living standards might be influenced by contextual factors. It is recommended that policymakers take into account these distinctions when formulating policies pertaining to information and communication technology (ICT) and income inequality. The researchers conducted a comparative analysis utilizing regression analysis to examine the influence of information and communication technology (ICT) on income inequality in both developed and developing countries. Data on

information and communication technology (ICT) usage, income inequality, and several control factors were collected for a sample of 34 countries spanning the period from 2000 to 2015. The researchers employed regression models with fixed effects and performed various sensitivity studies to assess the robustness of their findings. The researchers observed that the influence of Information and Communication Technology (ICT) on income inequality exhibits heterogeneity across different countries. However, no explicit rationale is provided by the authors to account for this variation. Future study should focus on examining the distinct contextual elements, such as variations in institutional frameworks or industrial structures, that have an impact on the relationship between the usage of ICT and income disparity .

Therefore, to test the relationship between standard of Living and Sustainable Development, the following hypothesis is developed:

- H1- Standard of Living (IV1) has a positive significant relationship on sustainable development (DV).

➤ *Telecommunication Companies' Impact on Digital Education*

Vishnu [23] conducted a study to investigate the digital competency of higher education students in the context of the COVID-19 epidemic and the subsequent shift to online learning. The research utilised a quantitative survey methodology to collect data from a sample of 340 college students in India. According to the findings of the study, a significant proportion of students in higher education possessed basic digital competence. However, there were certain gaps in their understanding and abilities pertaining to online communication, online cooperation, and digital security. Moreover, the study found that the level of digital proficiency differed depending on factors such as age, gender, and previous exposure to online education .

The study conducted by Babatope [6] revealed that the Nigerian telecoms sector exerted a favourable influence on digital education. However, the industry also encountered challenges, including insufficient network infrastructure and restricted student access to devices. The research put forth various approaches, such as the establishment of public-private partnerships and the allocation of resources towards network infrastructure, as potential solutions to overcome these challenges and improve the availability of digital education in Nigeria. This mixed-methods study employed a literature review, online questionnaires, and in-depth interviews with experts from the telecommunications industry, digital education, and education policy to gather data .

According to the study conducted by Hassan [11] the telecommunications sector exerted a substantial influence on the realm of digital education. However, the researchers also identified several challenges that impeded progress in this domain, including the presence of a digital divide and the absence of adequate regulatory frameworks. In order to augment the influence of the industry on digital education,

the review has put forth proposals including the allocation of resources towards network infrastructure and the implementation of regulations aimed at fostering digital inclusivity. This paper offers a thorough examination of the influence exerted by the telecommunications industry on digital education. However, further investigation could be undertaken to explore the precise methodologies and technology employed by the business to support digital education. The present study utilised a rigorous systematic literature review approach, wherein data was collected by conducting a comprehensive search of scholarly databases utilising specific keywords and criteria for inclusion and exclusion.

According to the research conducted by Shahid [20] it was determined that the telecommunication sector in Pakistan had a beneficial influence on digital education within higher education establishments. However, the industry also encountered obstacles such as insufficient network infrastructure and limited availability of devices. The researchers pointed out many approaches, including the establishment of public-private partnerships and the allocation of resources towards network infrastructure, as potential solutions to overcome these challenges and improve the availability of digital education in Pakistan. This research elucidates the significance of the telecommunications sector in enabling the implementation of digital education within higher education institutions in Pakistan. Further research could be conducted to explore the impact of the industry on digital education across various educational levels in Pakistan. The present study utilised a qualitative research methodology, wherein data was collected through a comprehensive examination of existing literature and conducting in-depth interviews with knowledgeable individuals from the telecommunications business, higher education, and education policy .

Hussain [12] conducted a study which revealed that the communications sector in China and India exerted a substantial influence on digital education, notwithstanding the challenges posed by the digital divide and the absence of regulatory frameworks. The study proposed that in order to enhance the industry's influence on digital education in both nations, it is advisable to allocate resources towards network infrastructure and implement regulations that foster digital inclusion. This research presents a comparative examination of the influence of the telecommunications sector on digital education in China and India. Subsequent investigations may explore the influence of the telecommunications sector on digital education in other nations characterised by distinct contextual factors and obstacles. The data collection for this comparative study involved doing a literature review, administering online questionnaires, and conducting in-depth interviews with experts from the telecommunications industry, digital education, and education policy sectors in both nations .

Therefore, to test the relationship between Digital Education and Sustainable Development, the following hypothesis is developed:

- H2- Digital Education (IV2) has a positive significant relationship on Sustainable Development (DV).

➤ *Telecommunication Companies Impact as a Moderator on Sustainable Development*

According to Bello and Othman's [7]. study, there are over 263 million uneducated children worldwide, and Nigeria is not exempt from the problem of inadequate primary education. This study examined the impact of the telecommunications industry on the progress of education in Nigeria, specifically focusing on the activities of Etisalat Telecommunications. The results suggest that Etisalat has made a substantial impact on the progress of the education industry in Nigeria, namely targeting primary education. In addition, the intervention is in accordance with Sustainable Development Goal 4, which focuses on the provision of Quality Education. The intervention has led to improvements in infrastructure, school enrollment, and particularly, the quality of education has been enhanced. The current study aims to support the examination of private funding for the promotion of primary education in Nigeria and other nations, thereby providing assistance to educational establishments.

Matinmikko-Blue [16] emphasised the potential of mobile communications as a tool for developing a communication infrastructure that has the capacity to promote local economic development in disadvantaged communities. This technology has the potential to address barriers to economic resource access by facilitating mobile money and micro-financing services, as well as creating employment opportunities for persons living in severe poverty. The usage of mobile devices allows students to conveniently access educational resources at their convenience, regardless of their location. Educational practitioners utilise mobile devices for a diverse array of objectives, encompassing but not restricted to the facilitation of literacy and numeracy pedagogy, as well as the provision of interactive tutoring. The use of mobile learning has the potential to address economic disparities, geographical discrepancies between rural and urban regions, and gender inequities .

The empirical study conducted by Shakil and Islam [21] examined the impact of communications infrastructure on sustainable development in underdeveloped countries. It has been found that the telecommunications infrastructure exerts a notable positive impact on economic growth, social development, and environmental sustainability. The researchers conducted an empirical analysis utilising panel data from 45 developing nations to investigate the influence of communications infrastructure on sustainable development. The research utilised a range of econometric methodologies, encompassing fixed and random effects models.

The study conducted by Obeng-Odoom [18] investigated the impact of telecommunications on the sustainable development goals of Africa. The author has highlighted various barriers that hinder the sector's capacity to contribute to sustainable development, including inadequate infrastructure, exorbitant expenses, and restricted

coverage. A comprehensive literature review was undertaken to assess the influence of telecommunications on Africa's sustainable development objectives. The author conducted a comprehensive examination of existing literature and identified areas where further research is needed.

In their study, Alhassan and Boateng [3] conducted an analysis to investigate the influence of mobile telecommunications on the economic growth and sustainable development of sub-Saharan Africa. It has been found that mobile telecommunications exert a beneficial influence on both economic growth and social development. However, in order to foster sustainability, it is imperative to implement regulations that ensure the affordability and accessibility of these services. A quantitative study was done to examine the influence of mobile telecommunications on economic growth and sustainable development. Their study utilised panel data from 30 sub-Saharan African nations. The research conducted an estimation of the influence of mobile telecommunications on the dependent variables by employing a model that incorporates fixed effects.

Therefore, to test the moderator relationship between Telecommunication companies' contribution and sustainable development, the following hypothesis is developed:

- H3 - Telecommunication companies' contribution (MV) has a significant role and moderating effect on the relationship between Standard of Living (IV1) and Sustainable development (DV).
- H4- Telecommunication companies' contribution (MV) has a significant role and moderating effect on the relationship between Digital education (IV2) and Sustainable development (DV).

➤ *Digital Education and Standard of Living Impact on Sustainable Development*

The studies conducted by Azad [1]. and Bakar [5] were focused on examining the impact of digital education in the context of attaining the Sustainable Development Goals (SDGs). The primary objectives of these investigations were to explore the specific role played by digital education in advancing the SDGs, as well as to identify any existing research deficiencies and provide potential avenues for future research in this domain. The present study identifies a research gap pertaining to the insufficiency of empirical evidence and comprehensive analysis on the influence of digital education on Sustainable Development Goals (SDGs) inside developing nations. The researchers did a comprehensive evaluation of the scholarly literature published between the timeframe of 2015 to 2020. The research encompassed a selection of scholarly publications sourced from many academic databases, namely Scopus, Web of Science, and Google Scholar. The researchers employed a content analysis methodology to amalgamate the outcomes derived from the comprehensive examination of existing scholarly works. The research has identified five key themes that elucidate the potential of digital education in effectively contributing to the attainment of the Sustainable Development Goals (SDGs). These themes encompass: (1) augmenting educational accessibility, (2) enhancing

educational quality, (3) fostering lifelong learning, (4) bolstering employability prospects, and (5) addressing concerns pertaining to environmental sustainability. The researchers discovered that digital education possesses the capacity to effectively contribute to the attainment of the Sustainable Development Goals (SDGs), particularly in underdeveloped nations where conventional educational institutions encounter notable obstacles. Nevertheless, the authors also acknowledged the necessity for additional study in order to ascertain the optimal approaches for leveraging digital education to effectively accomplish the Sustainable Development Goals (SDGs) within certain contexts.

The study conducted by Sreekumar [22] aimed to examine the correlation between the level of living and sustainable development. The primary objective of this study is to investigate the influence of the standard of living on three key dimensions of sustainability, namely environmental sustainability, social sustainability, and economic sustainability. Although there has been extensive research conducted on sustainable development, there is a limited body of literature that specifically investigates the influence of standard of living on sustainable development. This study aims to fill the existing research vacuum pertaining to the empirical investigation of the correlation between standard of living and sustainable development. The research design employed in this study was quantitative in nature, utilizing secondary data obtained from the World Bank for a total of 132 nations. The research employed composite indices as a means of assessing the levels of standard of life, environmental sustainability, social sustainability, and economic sustainability. Regression analysis was employed in the study to investigate the influence of standard of living on the three criteria of sustainable development. The research revealed a positive correlation between the standard of living and economic sustainability. Nevertheless, the research revealed an inverse correlation between the standard of life and both environmental sustainability and social sustainability. The study posits that there exists a positive correlation between a high quality of living and elevated levels of resource use and pollution, hence exerting a detrimental influence on both environmental and social sustainability. The research emphasises the need of achieving a harmonious equilibrium between economic expansion and the preservation of environmental and social well-being.

Jiménez-Zarco [14] believe that digital education has emerged as a significant instrument in the pursuit of sustainable development goals (SDGs) on a worldwide scale. Nevertheless, there exists a dearth of actual data regarding the influence of digital education on sustainable development. The objective of this study is to evaluate the influence of digital education on sustainable development by examining a specific instance of a Massive Open Online Course (MOOC) focused on climate change. Despite the existence of several studies pertaining to digital education and sustainable development, the body of research in both domains remains rather constrained. The primary objective of this study was to address the existing research void by investigating the influence of a Massive Open Online Course (MOOC) focused on climate change on the promotion of

sustainable development. The research revealed that MOOC content exhibited a favourable influence on the advancement of sustainable development. This was primarily attributed to its provision of pertinent and applicable knowledge pertaining to climate change and sustainable development.

According to Awolusi [4] the issue of sustainable development is of significant importance for emerging nations, with a particular focus on sub-Saharan Africa. The standard of living plays a crucial role in influencing the sustainability of development within these nations. The objective of this study is to evaluate the influence of the level of living on sustainable development in the sub-Saharan Africa region. While there exists a substantial body of literature pertaining to sustainable development and the concept of standard of living, the empirical evidence about the influence of standard of living on sustainable development in sub-Saharan Africa remains scarce. The primary objective of this study is to address the existing research void by examining the influence of the standard of living on sustainable development within these nations. The present study employs a panel data analysis technique to investigate the influence of standard of living on sustainable development in the sub-Saharan African region. This study utilized data collected from a sample of 24 nations located in the sub-Saharan African region, spanning the time frame from 2000 to 2018. They used two indicators as proxies to measure sustainable development: the Human Development Index (HDI) and the Environmental Performance Index (EPI). The research revealed that the level of living in sub-Saharan Africa exerts a beneficial influence on the attainment of sustainable development. The research revealed a positive correlation between an improvement in the standard of living and a rise in both the Human Development Index (HDI) and the Environmental Performance Index (EPI) scores. Additionally, the research revealed that government performance, education, and health are additional characteristics that contribute positively to sustainable development in the sub-Saharan Africa region.

The COVID-19 epidemic has compelled organizations to undergo extensive digitalization of their operational systems. Although the utilization of digital platforms is not a novel concept, the extent to which they enhance policy integration within the public service domain remains largely unexplored. Previous research conducted in many countries have provided confirmation about the significant influence of the telecommunication industry on the standard of life. Additionally, these studies have also explored the implications of digital education on sustainable development. This study aims to investigate the impact of digitalization in the telecommunication industry and the integration of Sustainable Development principles in public administration on the Sri Lankan context. Additionally, it is crucial to take into account the need to address the digital divide, which is imperative for individuals who have been left behind due to various unavoidable situations. Bridging this barrier is needed in order to facilitate access to information, hence fostering the development of new enterprises and the acquisition of knowledge. Moreover, the current study examines the findings that were gathered in order to

investigate the potential contributions of the telecommunication industry towards the attainment of sustainable development, as well as its impact on the standard of living and digital education in Sri Lanka.

➤ *Research Conceptual Framework*

According to a review of the applicable literature, each of those mentioned fundamental practices has its own effect on sustainable development and its objectives. The conceptual framework was devised as a result of a literature review. In this study, the independent variables (IV) are modified SDGs 1 and 4 out of 17: Standard of living (IV1) and Digital education (IV2). Sustainable Development is the

dependent variable (DV). The telecommunication companies' contribution serves as a Moderating Variable (MV) in this framework. Thus, it has a strong contingent effect on the relationship of Independent and Dependent variables. It modifies the original relationship between the independent and dependent variables in that the relationship holds true for some categories of the sample but not for the other categories. According to the literature the telecommunication industry can serve as a moderator on this by the following factors. Using the current conceptual framework, the researchers will now provide hypotheses for this study (figure 1).

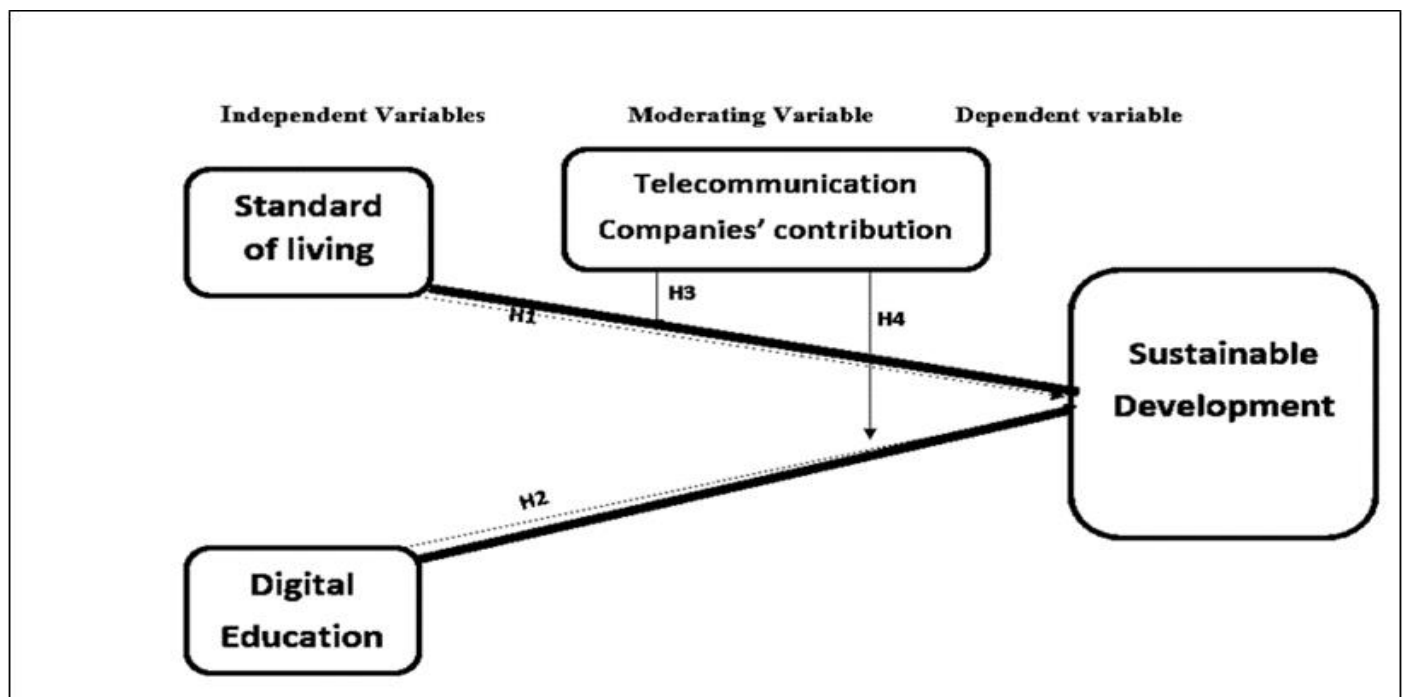


Fig 1 Research Framework

➤ *Research Hypothesis*

- H1- Standard of Living (IV1) has a positive significant relationship on sustainable development (DV).
- H2- Digital Education (IV2) has a positive significant relationship on Sustainable Development (DV).
- H3 - Telecommunication companies' contribution (MV) has a significant role and moderating effect on the relationship between Standard of Living (IV1) and Sustainable development (DV).
- H4- Telecommunication companies' contribution (MV) has a significant role and moderating effect on the relationship between Digital education (IV2) and Sustainable development (DV).

**III. METHODOLOGY**

In this study researchers investigated the cause-and-effect relationship between the independent variables and the dependent variable. This study will adopt a positivist approach. Since the researcher intends to draw conclusions based on the questionnaire-derived hypothesis as part of

quantitative research, the strategy would be deductive. As the primary data collection technique, a quantitative approach will be employed. The Non- probability convenience sampling technique is the principal focus of this study. Due to the specific categories included in the investigation, the researcher utilized nonprobability convenient sampling as a sampling technique. The investigation results were generalized using a sample of 400 individuals. The sample size will be determined using the confidence level of 95% and the estimated error of 5% from the study by Krejcie and Morgan [17]. 500 questionnaires were distributed to students at the advanced, undergraduate, and graduate levels. In addition, a statistical analysis softwares SPSS and Smart PLS was utilized to analyze the data.

The current research questionnaire consists of fourty questions using a six-point Likert scale to quantify variables based on previously defined characteristics. The first six queries assessed the first independent variable (standard of living) using the categories income, necessities, availability, affordability, knowledge, and employability. Skills, support, capacity, access, assistance, and quality were used to

evaluate the second independent variable (Digital education). The dependent variable (Sustainable Development) was measured with ten questions based on the impact of the telecom industry on society, the environment, and the economy. Furthermore, other ten questions were prepared for the moderating variable (telecommunications companies' contributions), which were measured using dimensions such as affordable data packages, employment opportunities, useful programmes, collaborations with schools, educational necessities, poverty reduction, and the facilitation of providing quality education.

contributions), which were measured using dimensions such as affordable data packages, employment opportunities, useful programmes, collaborations with schools, educational necessities, poverty reduction, and the facilitation of providing quality education.

**IV. RESULTS AND DISCUSSION**

According to the results carried out in the study, a reliability test was conducted. This was to ensure that the variables corresponded to each other. The results are shown in Tables 1. Also, a path coefficient was conducted to identify the effects of the variables, as shown in Table 2.

Table 1 Construct Validity and Reliability

Variable	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Digital education	0.952	0.958	0.966	0.876
Standard of Living	0.884	0.915	0.913	0.725
Sustainable Development	0.985	0.985	0.987	0.880
Telecommunication companies Contributions	0.982	0.889	0.978	0.879

Table 2 Path Coefficient

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ( O/STDEV )	P values
Digital education -> Sustainable Development	0.181	0.176	0.068	2.656	0.004
Standard of Living -> Sustainable Development	-0.340	-0.339	0.054	6.276	0.000
Telecommunication companies' contributions -> Sustainable development	0.813	0.802	0.139	5.848	0.000
Telecommunication companies' contributions x Standard of Living -> Sustainable development	0.339	0.336	0.113	3.000	0.001
Telecommunication companies' contributions x Digital Education -> Sustainable development	0.005	0.003	0.152	0.035	0.486
R -square = 0.747 R-square adjusted Sustainable development =0.744					

The construct reliability and validity tests showed that the Cronbach's alpha value for the standard of living and digital education variables have changed, however the value for sustainable development not changed and is therefore all are reliable. In addition, the composite reliability was calculated and values in all variables higher than 0.80. In conclusion it can be said that the variables have a high reliability and consistency (Table 1).

Hypothesis 1: Digital education has significant positive relationship towards Sustainable development. The hypothesis reveals that there is significant positive relationship between Digital Education and Standard of Living and thus, it is supported (p-value= 0.001). This indicates that digital education influences the sustainable development significantly.

After the validation of the model and the testing of the constructs, the Hypotheses were tested (Table 2), whether they get accepted or rejected.

Hypothesis 2: standard of living has significant positive relationship towards sustainable development. The hypothesis reveals that there is significant positive relationship between standard of living and sustainable development and thus, it is supported (p-value= 0.001). This indicates that standard of living influences the sustainable development significantly.



Hypothesis 3: Telecommunication companies' contributions has a significant role and moderating effect on the relationship between standard of living and sustainable development. The hypothesis reveals that there is an significant positive relationship and moderating effect between standard of living and sustainable development thus, it is supported (p-value= 0.001). This indicates that Telecommunication companies' contributions has a significant role and moderating effect on the relationship between standard of living and sustainable development.

Hypothesis 4: Telecommunication companies' contributions has a significant role and moderating effect on the relationship between Digital education and sustainable development. The hypothesis reveals that there is a insignificant negative relationship and moderating effect between Digital education and sustainable development thus, it is supported (p-value= 0.486). This indicates that Telecommunication companies' contributions has a insignificant role and moderating effect on the relationship between sustainable development.

As per the obtained in the current study, the researcher concluded that drawing from the analysis, standard of living has significant positive moderating effect between telecommunication companies towards sustainable development. Digital education has a positive significant relationship towards sustainable development. Lastly, Telecommunication companies' contributions towards Digital education as moderator shows no moderating effect towards sustainable development in Sri Lanka.

## V. CONCLUSION AND RECOMMENDATIONS

Researchers investigate the effect of telecommunication companies as a moderator on standard of living, Digital education, and sustainable development in Sri Lanka. To understand the viewpoint, one of the variables telecommunication companies' contributions, acts as a moderating variable on the relationships between independent variables (standard of living and digital education) and dependent variable (sustainable development). Drawing from the analysis previously, the proposed hypotheses include both supported and not supported results. The COVID-19 and the current economic crisis had a disproportionately negative impact on the social and economic spheres of low-income developing nations like Sri Lanka. These nations cannot achieve sustainable development on their own and require mutual cooperation and partnership.

In addition, COVID-19 had a negative impact on the industries that contributed the most to Sri Lanka's economy and employment, such as export industries and the garment industry. In this regard, the telecommunications industry is vital to a nation's development. It not only contributes to economic development, but also functions as a crucial platform for long-term development by offering innovative solutions to environmental and social issues. In this investigation, the conceptual framework was constructed using findings from the literature. Based on their review of

the relevant literature, the researchers identified a research lacuna in this study. It was discovered that Sri Lanka lacks recent studies on how the telecommunications industry contributes to Sustainable Development in this regard.

Associated with the moderating variable (telecommunication companies contributions), both effect was used to identify the impact between the independent variables (standard of living and digital education) towards the sustainable development. Drawing from the summary of findings, the proposed hypotheses consist of supported and not supported relationships. Thus, significant influential variables could be further investigated and enhanced in order to build up the comprehensiveness of conceptual framework. Also, the mediating and moderating variables could be employed as potential predictors in the field of educational digital literacy in the future research.

This study is confined only to telecommunication industry impact on Digital education and standard of living towards sustainable development. Therefore, a comparative study should be carried out to explore how other industries can contribute towards sustainable development. Also, an analysis should be carried other different areas.

This study investigated the effect of telecommunication companies as a moderator on standard of living, Digital education, and sustainable development in Sri Lanka. The incorporation of digital education in Sri Lanka serves as a catalyst for enhancing students' skill sets, thereby bolstering their competitiveness in the labor market. The matter at hand holds significant importance for the sector as it ensures the presence of a skilled and capable workforce. The integration of telecommunications companies within the university setting has the potential to cultivate innovative teaching methodologies and cutting-edge technology, thereby elevating the overall standard of education and research.

The implementation of digital education facilitates the creation of a global network, thereby providing Sri Lankan students with access to international educational resources and the ability to collaborate with peers and researchers worldwide. The involvement of telecommunications firms in sustainable development initiatives has the potential to yield positive environmental results, which can be advantageous for both environmental organizations and the wider public. The company's Corporate Social Responsibility (CSR) efforts are an integral part of its overall business strategy. These initiatives are designed to address the company's impact on society and the environment, while also creating shared value for all stakeholders. By implementing CSR practices, the company Telecommunication firms often engage in Corporate Social Responsibility (CSR) initiatives, wherein they extend their support to local communities and tackle social and environmental issues.

Our results demonstrates that increases in income, education, healthcare, and access to basic services can contribute to economic growth, human development, poverty alleviation, and environmental sustainability. Sri Lanka can support sustainable development by raising the standard of

life and striking a balance between economic success, social well-being, and environmental preservation. Also, Sri Lanka can connect the potential of digital learning to promote sustainable development goals and build a more open, ecologically sensitive, and knowledge-based society by harnessing digital technology and encouraging access to digital education.

Furthermore, this study identified several obstacles that hinder the digital education and sustainable development initiatives of telecommunication companies. currently located in Sri Lanka. The primary obstacles to accessing mobile internet usage are limited literacy and computer skills. The adoption of mobile internet is impeded by the lack of affordability of mobile devices. Low- and middle-income families in Sri Lanka have been unable to afford basic internet-enabled mobile devices also geographical variations in this accessibility. The current cost of data is significantly higher compared to the monthly income of individuals with low to moderate incomes. Although there have been improvements for specific demographics, the issue of cost continues to pose a significant challenge for individuals from low-income and marginalized communities. Safety and security continue to pose significant obstacles to the adoption of mobile internet usage. The utilization of locally relevant content by users is experiencing growth, however, it continues to present a significant challenge in Sri Lanka and other nations. The implementation of this strategic digitalization initiative has the potential to significantly enhance economic growth in the foreseeable future for Sri Lanka. Mobile networks play a pivotal role in facilitating widespread access to innovative applications, thereby serving as a critical component of a thriving digital economy. Regional agreements such as the Regional Comprehensive Economic Partnership (RCEP) and digital trade agreements have the potential to enhance the growth of the global and regional digital economy. Therefore, the strategic implementation of internet adoption will contribute to the economic growth of Sri Lanka and the Asia-Pacific region.

## VI. LIMITATIONS AND FURTHER RESEARCH RECOMMENDATIONS

This study is confined only to the telecommunication industry impact on Digital education and standard of living towards sustainable development. Therefore, a comparative study should be carried out to explore how other industries can contribute towards sustainable development. Also, an analysis should be carried out in other different areas. This study was focused only on SDG 1 (No Poverty) and SDG 4 (Quality Education). However, it should be extended to focus on other SDGs (Sustainable development Goals). Finally, it should be stated that the present study solely looked regarding the barriers to telecommunication industry to contribute for sustainable development in Sri Lanka. Similarly, studies can be carried out pertaining to any other industry to study the obstacles to contribute for sustainable development in Sri Lanka.

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