



THE CHANGING ROLE OF TEACHERS AND TEACHING STYLES IN THE CLASSROOM  
OF HIGH SCHOOLS IN GUYANA AMIDST THE PANDEMIC

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Doctorate of Education (EdD)

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## Abstract

THE CHANGING ROLE OF TEACHERS AND TEACHING STYLES IN THE  
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There is evidence, according to Blainey & Hannay (2021), that the pandemic has affected academic advancement. Nonetheless, even though the loss abated during the New Year, several investigators have ascertained that the impact was not as deleterious as Johnson et al. (2021) documented during the initial months of 2020. This study determined whether the changes in teacher roles during the pandemic were sustained throughout Guyana and how they impacted students' performance on the yearly May/June Caribbean Secondary Examination Certificate (CSEC) Examinations. The literature study examined how many aspects have been considered in studies to highlight how the pandemic has affected the learning process.

According to Creswell & Plano Clark (2018), the explanatory sequential mixed-method study design includes a sequential period of both qualitative and quantitative data collection and analysis. Given that both qualitative and quantitative data have to be used, this is the most effective approach. The researcher identified participants from three high schools in Guyana, which would provide sufficient data for the study. The sample was determined by a stratified sampling technique, looking for students and teachers who have been a part of these schools for

at least the preceding three years. Questionnaires, interviews, and scholarly publications were among the primary and secondary sources that were employed as data-gathering strategies.

The main conclusion is that teacher pedagogy would have changed due to the pandemic. The impact of these modifications varies, mostly based on the resources that are made available to educators and students in Guyana's schools. The study brings value to the Ministry of Education to create a plan of action for teachers and students of schools in Guyana regarding the competence and professional development of teachers. Additionally, Cyril Potter College of Education can create programmes that can be better suited to provide the teachers with the necessary skills to work with students in this classroom setting created by the pandemic.

## Declaration

I declare that I wrote this thesis entirely on my own and was not previously submitted, in whole or in part, with any other application for a degree. Unless it is specifically stated otherwise via reference or acknowledgment, the material offered is completely mine.

## AI Acknowledgment

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## Dedication

I dedicate this research to my mother Bibi Zulaika and my father, the late Vrejanand Rupnarain. Of whom I have felt nothing but love and unwavering support.

### Acknowledgment

I am incredibly grateful to the Committee of Unicaf University in Zambia as well as my supervisor, Dr. Isaak Papadopoulos, for his continuous support throughout my whole study process. I would especially want to thank my colleagues and the study participants for their contributions to the successful completion of this research. Also, the constant support from my family and friends has given me along the way to complete my study was greatly appreciated.

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**List of Abbreviations**

|         |  |
|---------|--|
| CXC     | Caribbean Examination Council                      |
| CSEC    | Caribbean Secondary Examination Certificate        |
| NGSA    | National Grade Six Assessment                      |
| CAPE    | Caribbean Advanced Proficiency Examinations        |
| NCERD   | National Centre for Education Resource Development |
| CARICOM | Caribbean Community                                |
| UG      | University of Guyana                               |
| CPCE    | Cyril Potter College of Education                  |
| MOE     | Ministry of Education                              |
| NGSA    | National Grade Six Assessment                      |
| QC      | Queen's College                                    |

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## CHAPTER 1 INTRODUCTION

The COVID-19 pandemic has affected more than 1.6 billion students in more than 190 nations, upending educational systems all over the world. Because the crisis revealed and exacerbated long-standing systemic flaws in teacher preparation, technology capabilities, and instructional methods, the repercussions were particularly severe in Guyana. The fast evolving role of educators and the alteration of pedagogical practices in response to the new educational reality brought about by the pandemic are at the core of these difficulties. The pandemic presented both a disruption and a potential turning moment for transformation in a nation where the delivery of education had mainly stayed traditional for decades.

A teacher-centered, direct instruction style has mostly defined secondary education in Guyana since the country's educational system was formalized in 1976. This approach, which is sometimes referred to as "chalk and talk," entails educators taking the lead in imparting knowledge while pupils are supposed to passively take it in. According to Mayer (2008), this conventional teaching approach placed more emphasis on knowledge transfer rather than on independent study, critical thinking, or active participation. According to Killen (2009) and Skinner (2010), this method perpetuated a hierarchical classroom dynamic in which the teacher is viewed as the authoritative figure and the student's role is one of compliance and submission.

Although the teacher-centered technique works well for teaching content in structured settings, it made the assumption that students' learning needs and skills are uniform, which is becoming less and less true in classrooms of the twenty-first (21<sup>st</sup>) century. These methods have long been emphasized in Guyana's teacher preparation programmes. The nation's main teacher training institution, Cyril Potter College of Education (CPCE), has long placed a strong emphasis on structured teaching methods designed to help students grasp the material and do well on tests. At the University of Guyana (UG), progressive pedagogical approaches

including technology integration, student-centered learning, and differentiated instruction are usually only offered at the bachelor's degree level. However, before 2019, only a small percentage of teachers, mostly those who lived in cities like Georgetown, had the chance to further their education at the university level.

Geographic isolation, financial limits, and administrative restrictions on study leave were among the major obstacles faced by teachers in rural and hinterland areas. In many regions of the nation, a deeply ingrained dependence on antiquated teaching techniques was exacerbated by this unequal access to professional development. Guyana remained mostly reliant on traditional paper-based tests, even though the Caribbean Examinations Council (CXC) took early steps to test digital exams in 2016, partly due to the Region's frequent natural disasters.

For instance, Guyanese students still used manual drafting methods, even though other nations in the region had started utilizing programmes like AutoCAD for Technical Drawing. Guyana was unprepared for the shift to remote learning when the pandemic struck on March 8, 2020, and schools were shut down on March 17, 2020. Schools were physically closed for more than two years, and they weren't fully reopened until April 2022.

With differing degrees of success, the education sector rushed to implement alternate teaching modalities and online learning platforms during this time. The status of national and regional exams was the most pressing issue during the school closures. Since the Guyanese government was in charge of the National Grade Six Assessment (NGSA), which was used to assign children to secondary schools, it was rescheduled and modified. However, in order to maintain equity among its fifteen (15) member states, CXC's regionally administered Caribbean Secondary Education Certificate (CSEC) exams adhered to a more stringent schedule and format. Guyanese students had many difficulties as a result of this; they were less prepared than their regional peers because they had little access to regular instruction

during the lockdown. Despite releasing topic lists in 2020–2022 to alleviate student strain, CXC withdrew these concessions in 2023.

Since many pupils, especially those in rural and Indigenous communities, had not yet recovered from the pandemic-related educational gaps, this choice exacerbated already existing tensions. During the pandemic, learning loss was significant and pervasive. Over 95% of students worldwide suffered from learning loss, particularly in systems that were ill-prepared for distance learning, according to Engzell et al. (2021). According to Kuhfeld (2020), learning loss is a quantifiable reduction in academic knowledge and abilities brought on by extended absences from school. Many pupils in Guyana missed months of formal education, and some in isolated places were without contact with teachers for as long as a year.

Today's classrooms still show the long-term effects of this disruption, as pupils struggle with material that assumes information they never learned. At the secondary level, where CSEC achievement can influence future access to higher education or employment, these effects are most noticeable. The pandemic also compelled a reconsideration of the present definition of "teaching." At first, a lot of educational institutions and educators tried to simulate the classroom online by giving lectures via Zoom or Google Meet. However, the scope of this technique was constrained and frequently lacked interactivity.

Educators who were not familiar with Internet resources found it difficult to modify their teaching methods, and many of them kept using the lecture-style of teaching. In certain instances, students were required to review the contents independently after simply logging into sessions and listening passively. The special advantages of online learning environments were not utilized by this restricted adaptation. According to Prensky (2001), students who are digital natives today need new ways to interact that take advantage of the customization, immediacy, and interaction that digital technologies may offer. According to Vai et al.

(2015), students who use technology extensively outside of the classroom anticipate the same degree of creativity and responsiveness from it.

To address these issues, the Ministry of Education initiated a number of teacher training programmes through the National Centre for Educational Resource Development (NCERD) to enhance pedagogical adaptability and digital literacy. These programmes provided teachers with access to digital content development tools, online learning platforms, and student engagement techniques that were effective for distance learning. The effects of these programmes, however, differed greatly. A lack of experience, poor internet connectivity, or inadequate institutional support hindered the ability of some teachers to innovate and adapt. Additionally, Guyana's topography made it difficult to provide professional development to isolated regions, which exacerbated already-existing inequalities in the quality of education.

Thus, the crisis exposed a major conflict in the educational system: the continued use of conventional approaches in a time when creativity, adaptability, and student-centered learning are becoming more and more important. Some educators held onto the idea that the system didn't need to be fixed, while others saw the pandemic as a chance for change. Many people who are involved in education still have the mentality that *"if it isn't broken, don't fix it."* However, the pandemic made it abundantly evident that the system was, in many respects, ill-equipped to accommodate students in the twenty-first century. Whether or not the adjustments implemented during the pandemic were successful, they now act as a guide for potential future developments in Guyana's educational system.

The job of the teacher has changed fundamentally in this scenario. Teachers are expected to be more than just information providers; they are also required to mediate digital tools, facilitate learning, and attend to the emotional and social needs of their pupils. To shape the future of education in Guyana, it is essential to comprehend how this position has

changed over time and how much teachers have modified their approaches and perspectives. Therefore, the purpose of this study is to investigate how teachers' roles and methods of instruction changed in secondary schools both during and after the pandemic. By doing this, it hopes to offer information that will guide future post-pandemic teacher training plans, policy creation, and educational planning.

### **1.1 Statement of the Problem**

The sudden worldwide shift to online education brought about by the COVID-19 pandemic gave rise to what Beatty (2019) refers to as "emergency remote teaching," in which instruction moved from in-person to virtual settings with no planning or assistance.

The change revealed long-standing systemic flaws in Guyana, such as a general lack of readiness for digital education, restricted internet connection in remote areas, and inadequate technical infrastructure (Van Deursen & Van Dijk, 2014; CXC, 2020). Despite previous regional attempts, such as the Caribbean Examinations Council's (CXC) drive for online testing and classroom technology use as early as 2016 (CXC, 2020), these constraints highlighted the nation's lagging in integrating technology into education.

Many Guyanese educators returned to traditional "chalk-and-talk" methods once schools reopened, despite the fact that the pandemic offered a chance for pedagogical innovation and digital adoption (Sands & Sushok, 2020). Given the evidence that technology integration can improve student engagement and learning results, this reversal raises major questions about the durability of educational innovations (Zheng et al., 2020). Furthermore, students of the twenty-first century are "digital natives," more open to electronic learning, as noted by Prensky (2001). As a result, the continued use of traditional teaching techniques is becoming less and less in line with the demands of the students.

Although there is a wealth of research on the revolutionary impact of COVID-19 on education from around the world (Hodges et al., 2020; Moss et al., 2021; Darling-Hammond, 2020), little empirical study has been done on the Guyanese context, where differences in teacher preparedness, settlement patterns, and resource accessibility pose particular difficulties. Therefore, the main issue is that it is still unclear how many of the teaching practices that were altered by the pandemic have been maintained or reversed in Guyana's high schools and how these changes have impacted student performance on important tests like the Caribbean Secondary Education Certificate (CSEC).

## **1.2 Purpose of the Study, Research Aims, and Objectives**

This study aims to explore how teaching techniques and the role of teachers changed in Guyana's high schools during and after the COVID-19 pandemic, with a focus on how these changes affected students' academic performance. The study specifically aims to ascertain which pandemic-driven changes like online and hybrid learning strategies, have persisted (Beatty, 2019), how teaching methods vary among Guyana's various geographic regions, and how these changes have affected students' performance on the CSEC exams (CXC, 2020).

In order to capture the subjective experiences and quantifiable results of the post-pandemic educational landscape, this research uses an explanatory sequential mixed-method that incorporates teacher and student views with performance data. This study examines how to strike a balance between traditional and creative techniques in the Guyanese setting, in keeping with Silva and White's (2015) contention that disruptions raise concerns about the dependence on traditional ways of education. The results will be able to guide evidence-based reforms that improve student outcomes in Guyana's secondary education system by

strengthening pedagogical practice, enhancing technological integration, and offering crucial insights to policymakers, school administrators, and teacher training programmes.

*One of the primary objectives of the study is to assess the pandemic's long-term consequences on instructional practices.* The traditional "chalk-and-talk" approach, which has been utilized in classrooms for decades, was useless in an online learning environment. To better suit the available digital platforms, educators were forced to adapt their pedagogical approaches. This study examined whether these adjustments have lasted or whether teachers have returned to more traditional methods as schools have reverted to in-person education.

*The research would also investigate how teaching approaches change in Guyana's various geographic and economic environments.* The shift to online learning would have been simpler for schools in metropolitan regions since they usually have more resources than those in rural or poor locations. By examining these disparities, the researcher was able to identify areas that needed additional support and obtain a more thorough grasp of how the pandemic affected educational equality in Guyana.

*The study's primary focus was on how these teaching method modifications affect students' performance on regional tests, especially the CSEC exams.* In the Caribbean, Grade 11 students take the CSEC examinations as a crucial milestone, however, it's important to comprehend how the pandemic has affected students' study and performance. The purpose of the study was to better understand how the changes in teaching methods have influenced student results by gathering input from both teachers and students. Guyana's educational policies and practices will be greatly impacted by the study's conclusions. The Ministry of Education may utilize the information to create new curriculum and instructional methods that will better fulfill the requirements of students in the post-pandemic era. Policymakers would develop programmes that not only remediate the learning losses incurred

during the pandemic but also equip students for future problems by having a thorough grasp of the pandemic's effects on education.

The survey also pinpointed sectors in the educational system that need greater funding and assistance. *The study would shed light on the differences in educational opportunities and standards among Guyana's many areas, which would help determine how best to allocate resources.* This would guarantee that every student in Guyana, irrespective of their place of residence or socioeconomic status, has access to a top-notch education that would equip them for success in their academic pursuits and beyond.

This research offered a thorough examination of how the COVID-19 pandemic has affected the educational system in Guyana. Through an analysis of teaching techniques, learning loss, and student performance, the research would provide important new information on whether these changes are indicative of short-term or long-term changes in the way education is delivered. The results guided the creation of new curricula, instructional techniques, and policies that were better prepared students for the future and guaranteed that Guyana's educational system was egalitarian, robust, and up to the demands of a world that was changing quickly.

No empirical study has carefully investigated how these changes have continued or reversed in Guyana's secondary schools, despite a wealth of worldwide literature on pandemic-driven pedagogical change. Although research from around the world has shown how quickly digital technologies, blended learning, and teacher creativity are being adopted, little is known about how these practices continue in small developing nations. The necessity for specific data on Guyanese educators' experiences navigating the post-pandemic shift from emergency remote teaching to ongoing hybrid instruction is highlighted by this gap.

### ***Research Aims***

Numerous facets of life have been profoundly impacted by the COVID-19 pandemic, and the education industry is no exception. According to research by Blainey & Hannay (2021), there was evidence that the pandemic had hampered academic advancement. Although there was some improvement in academic losses as the year went on, Johnson et al. (2021) initially expected that the disruption during the first half of 2020 would be more severe than it was. The conventional methods of teaching, especially in Guyana, have not altered much despite these developments. Teachers have been using the traditional "talk and chalk" method for years, repeating lessons over the school year. Teachers thought the current system was workable and efficient; therefore, they embraced this approach. As such, there wasn't much drive to innovate or adapt to teaching methods.

Nonetheless, the pandemic has posed serious challenges to the current order. The shortcomings of conventional teaching techniques were brought to light in striking contrast when schools were shuttered and a move to distance learning became required. Teachers must use digital tools and online platforms to quickly adapt to changing learning settings to provide education. This sudden transformation has raised significant questions about the effectiveness of these new positions and instructional techniques in the post-pandemic classroom. Investigating how the pandemic has impacted Guyana's teachers' pedagogical approaches is the main goal of this study. The main objective of the study was to determine how effective these new roles and teaching methods were in light of the evolving classroom setting.

Considering that, despite the difficulties caused by the pandemic, standardized exams in Guyana have persisted with little to no changes, this study would investigate if the adjustments made to teaching methodologies have been adequate to fulfill the demands of students in this new environment.

Through the analysis of teacher and student perspectives, this study sought to shed light on the pandemic's long-term effects on Guyana's educational system. The study sought to determine if classroom modifications made by teachers during the pandemic had a long-term influence on instruction and whether they improved or worsened the efficacy of curriculum delivery. In the end, this study advanced our knowledge of how Guyana's educational system has responded to the difficulties brought on by the pandemic and what the nation's educational future holds.

### ***Research Objectives***

The purpose of this study is to look into how teaching methods and the role of educators have changed in Guyana's high schools during the COVID-19 pandemic. Significant changes in teaching methods, teacher duties, and student learning experiences were brought about by the pandemic; this research intends to investigate these changes in detail as well as their long-term effects on secondary education in the nation.

The first objective is to determine which changes in teaching methods brought on by the pandemic have persisted in Guyana's high schools. This entails investigating the use of blended and online learning strategies and differentiating between short-term modifications and advancements that are now essential to teaching in the classroom.

Analyzing the differences in teaching philosophies among high school educators in various regions of Guyana is the second objective. By taking into account elements like school infrastructure, resource accessibility, and urban vs rural environments, the study seeks to identify trends in pedagogical adaptability and variety in teaching methods nationwide.

The third objective focuses on measuring the influence of the developing role of educators on student achievement, particularly in high-stakes examinations such as the Caribbean Secondary Education Certificate (CSEC). This objective looks at how student

accomplishment and readiness have been affected by modifications to teacher roles, practices, and engagement tactics.

Examining how students see the shifts in teaching methods in comparison to the conventional pre-pandemic approaches is the fourth objective. Assessing the efficacy of novel techniques and their impact on student motivation, engagement, and learning experiences requires an understanding of how students perceive and react to these pedagogical changes.

The study's final objective is to suggest ways to improve and assist educators' teaching methods in classrooms following the pandemic. This goal is to guarantee that efficient teaching methods are maintained and that educational quality keeps rising in Guyana's high schools by creating strategies, policies, and professional development programmes.

### **1.3 Conceptual Framework Overview**

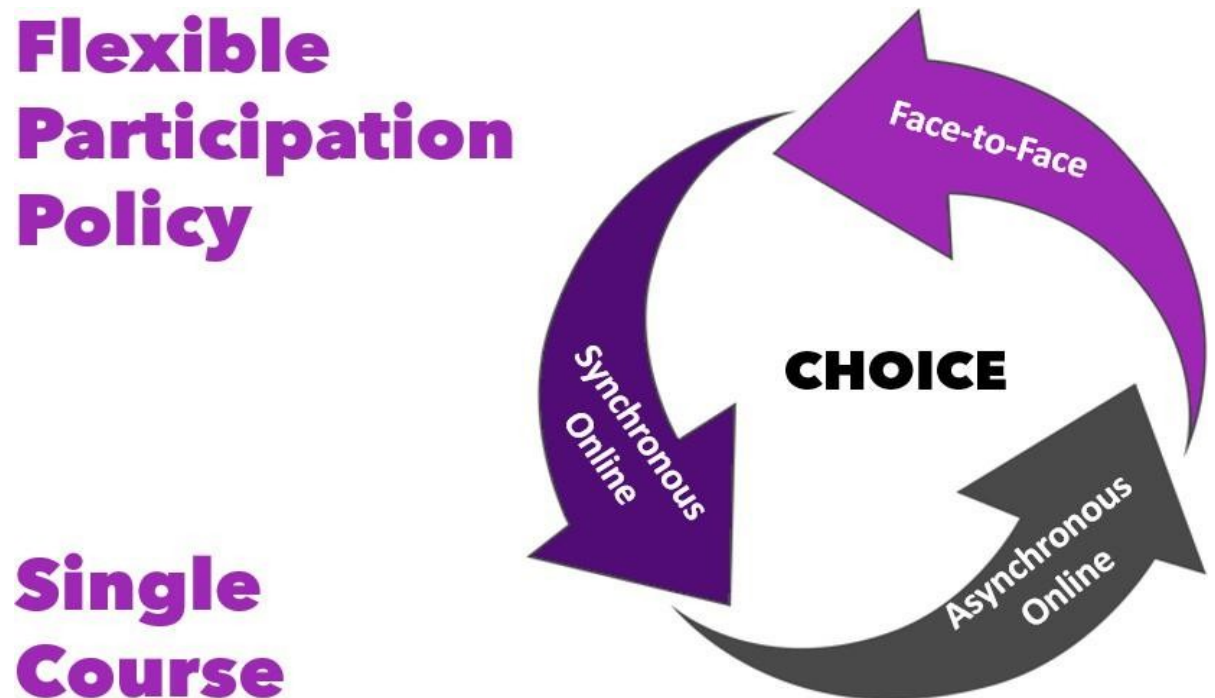
Beatty's (2019) HyFlex Model, which offers a conceptual framework for comprehending flexible and hybrid learning environments, serves as the foundation for this investigation. The paradigm places a strong emphasis on learner choice, technological preparedness, and pedagogical adaptability; three factors that were crucial during the COVID-19 pandemic when educators had to combine in-person and virtual learning. The current study's emphasis on teacher adaptation and the continuation of hybrid practices in Guyana's post-pandemic environment is a good fit for Beatty's approach.

Constructivist learning theory, which holds that students actively connect with peers, technology, and content to gain knowledge, is the foundation of the HyFlex Model. Teachers serve as facilitators in this paradigm, creating adaptable routes for student engagement that allow for both synchronous and asynchronous learning. It is possible to evaluate how teachers' pedagogical approaches changed in response to resource shortages, training

deficiencies, and infrastructure constraints by using this conceptual model to the educational system in Guyana.

### Figure 1

*Brian Beatty Hy-Flex Model of Learning (2019)*



#### 1.4 Theoretical Framework Overview

This study makes use of Rogers' (2003) Diffusion of Innovations Theory, which offers a useful framework for comprehending the dissemination and adoption of novel concepts, behaviors, and technologies within social systems. Relative benefit, compatibility, complexity, trialability, and observability are the five main characteristics that Rogers sees as affecting the pace of adoption. These factors collectively determine whether people and institutions embrace or reject an invention.

According to this study, one important educational innovation that occurred during and after the COVID-19 pandemic was the use of online and hybrid teaching modes. Whether online teaching offered pedagogical advantages (relative advantage), aligned with existing teaching philosophies (compatibility), was easy to use (complexity), could be tested incrementally (trialability), and produced observable results in student engagement or achievement (observability) were the five attributes that influenced teachers' willingness and ability to integrate digital tools.

A detailed examination of how instructional innovations dispersed unevenly among Guyana's urban, coastal, and hinterland schools is made possible by the use of Rogers' approach. It helps explain why, once in-person schooling began, some educators continued to use hybrid approaches while others switched back to traditional instruction. Additionally, by connecting the institutional and individual diffusion mechanisms that support flexible learning systems, the theory enhances Beatty's (2019) HyFlex Model. Because it links teachers' behavioral responses to the institutional, technological, and cultural factors that impact educational innovation in Guyana's post-pandemic context, Rogers' model serves as both an interpretative and analytical lens for this study.

## **1.5 Policy and Institutional Framework**

The national and regional policy frameworks that influence teacher practice and technology integration are inextricably linked to Guyana's educational revolution. A commitment to increasing digital literacy, expanding access to technology, and fortifying the educational system's resilience is outlined in the Ministry of Education's Strategic Plan (2021–2025). The plan's execution has been inconsistent, nevertheless, as equitable growth has been hampered by resource differences between coastal and hinterland schools. Although the policy acknowledges that information and communication technology (ICT) plays a

significant role in learning, it offers no advice on how to continue hybrid instruction outside of emergency situations.

CARICOM's Human Resource Development Strategy (HRDS 2030), which highlights innovation, high-quality education, and digital transformation as cornerstones of sustainable development, has an impact on Guyana's educational agenda on a regional level. According to the HRDS framework, technology will support regional mobility and lifelong learning in the Caribbean learning ecosystem. However, in Guyana, it is still difficult to translate these regional objectives into workable national policies, especially when it comes to digital infrastructure and teacher preparation.

Following COVID-19, international agencies like UNESCO and UNICEF have urged the inclusion of hybrid learning in long-term strategies for educational rehabilitation. To create inclusive, technologically enabled learning systems, the UNESCO Futures of Education Report (2021) emphasizes the significance of reevaluating pedagogy, assessment, and curricula. Instead than considering hybrid learning as a short-term emergency solution, Guyana needs to institutionalize it, and these suggestions align with that goal. The significance of the current study is emphasized by the institutional and policy setting. The research offers empirical data that can guide future policy reforms by analyzing how educators have adopted and maintained hybrid methods. National initiatives for teacher preparation, the distribution of digital resources, and the creation of a cogent framework for post-pandemic educational resilience are anticipated to be guided by the findings.

## **1.6 Philosophical and Paradigmatic Orientation**

The pragmatic paradigm, which stresses the practical application of research and the use of diverse approaches to address complicated real-world situations, is where this study fits in. Scholars like Dewey (1938) and Creswell and Plano Clark (2018), who contend that

methodological decisions should be guided by research questions rather than rigorous adherence to a particular epistemological position, are the foundation of pragmatics. This approach is especially suitable for the current study, which aims to comprehend the contextual meanings and quantifiable trends behind the continued use of hybrid teaching methods in Guyana's post-pandemic educational system.

According to this paradigm, human cognition, social context, and real-world experience combine to produce knowledge, which is both created and experiential. The pragmatic approach enables the researcher to combine qualitative methods (to investigate teachers' lived experiences, perspectives, and adaptive tactics) with quantitative methods (to capture general patterns and correlations among variables such as location, training, and technological availability). The findings' validity and applicability are reinforced by this integration, which also captures the complexity of the educational reforms being examined.

The study's objective of linking theory and practice is likewise supported by pragmatism. A balanced approach to research is made possible by the paradigm's recognition that both quantitative data and firsthand perspectives are useful in comprehending educational transformation. Thus, the philosophical position enhances the conceptual framework and methodological design of the study, guaranteeing that it not only explains phenomena but also offers practical insights for training, policy, and pedagogical innovation in Guyana's changing educational environment.

## **1.7 Nature and Significance of the Study**

Global educational systems faced previously unheard-of difficulties as a result of the COVID-19 pandemic, which forced teachers to re-evaluate their pedagogical duties and embrace creative teaching techniques. These difficulties were especially noticeable in Guyana because of the country's distinct geographic and socioeconomic setting, which

includes glaring rural-urban divides, restricted access to technology in the interior, and varying levels of teacher preparation (Ministry of Education, 2021). Although research on the pandemic's effects on teaching and learning has been conducted globally (UNESCO, 2020; Hodges et al., 2020), there is a conspicuous dearth of thorough studies that concentrate only on Guyana's secondary education system.

Given that local educational policies, infrastructure, and resource distribution diverge significantly from those in other Caribbean or international contexts, this disparity is noteworthy. Accurately evaluating how pedagogical modifications have affected teaching methods and student results in the post-pandemic setting requires an understanding of these local dynamics. Teachers in Guyana have historically mostly depended on direct, traditional methods of education, particularly in interior and rural areas where professional development and resources are scarce (Guyanese Education Statistics, 2019). However, during the pandemic, educators had to use technology, customized education, and student-centered pedagogical techniques due to the abrupt transition to remote and hybrid learning.

Due to differences in infrastructure, internet availability, and possibilities for teacher training, the adoption of these tactics varied by location. This variation offers an intriguing study environment because it enables the investigation of the ways in which teaching techniques interact with geographic location and resource limitations to affect student performance. No systematic study has looked at the long-term effects of these pedagogical changes on student achievement in Guyana's secondary schools, especially in relation to the Caribbean Secondary Education Certificate (CSEC) exams, despite anecdotal reports and disjointed studies on these trends.

When taking into account the multifaceted difficulties that students encountered, the research gap was even more noticeable. The pandemic affected student participation, motivation, and academic results by altering the social and cognitive contexts of classrooms

in addition to disrupting the continuity of learning (Dhawan, 2020). The shift to online learning has been the subject of research in other Caribbean countries (Gonzalez, 2021; CXC, 2022), but Guyana has particular contextual concerns, including large interior regions with low population density, inadequate transportation facilities, and erratic electrical supplies. These elements worsen educational disparities and cast doubt on the efficacy of pedagogical adjustments brought on by pandemics.

In order to close this knowledge gap and guide future educational policies and practices that were sensitive to socioeconomic and regional realities, empirical research is therefore desperately needed.

By examining how teachers' responsibilities and instructional practices have changed during and after the COVID-19 pandemic and how these changes have impacted student learning results, this study filled the identified gap. This study was important because it has the potential to offer a thorough, empirically supported knowledge of how teaching strategies, teacher adaptability, and student performance interacted in secondary schools in Guyana.

This study provided a comprehensive viewpoint that has been mostly lacking from previous studies by looking at both qualitative and quantitative aspects through instructor interviews, student questionnaires, classroom observations, and analysis of CSEC performance data. By doing this, it highlighted the unique difficulties and innovations in a Guyanese setting and adds to the expanding corpus of work on post-pandemic education.

The study also looked at how educational modifications vary by geography, highlighted the contrasts between inner, rural, and urban schools. Interior and rural schools frequently depended on more conventional teaching techniques, occasionally augmented by makeshift technology solutions, however, metropolitan schools generally profited from improved availability to digital tools, reliable energy, and skilled staff (Ministry of Education, 2021). Examining these variations offers important information on the efficacy and fairness

of educational initiatives during the pandemic, with lessons for similar crises or disruptions in the future. The study contributed to the knowledge of context-specific educational resilience and creativity by recording how educators in various places managed resource limitations and student requirements.

This research has implications for the larger educational system in addition to the classroom. Institutions that educate teachers, like Cyril Potter College of Education (CPCE), can benefit from the findings by using them to improve their pre-service and in-service teacher preparation programmes. Future educators will be prepared to handle emergencies effectively while upholding high standards for student learning outcomes thanks to an emphasis on digital literacy, hybrid teaching approaches, and adaptable pedagogical practices. The Ministry of Education's curriculum development initiatives can also benefit from the study's insights, which will help create teaching frameworks that are more adaptable to the varied requirements of students and able to reduce learning loss in interrupted learning contexts.

From a regional standpoint, the study provided vital data on student performance and readiness in a post-pandemic setting to the Caribbean Examinations Council (CXC) and other educational stakeholders. The study found places where students might need more help to succeed academically by examining patterns in CSEC scores and qualitative reports of instructional modifications. The Caribbean's overall educational resilience was improved by this evidence-based approach, which served as a basis for policy recommendations, focused interventions, and strategic resource allocation at the national and regional levels.

This work contributed theoretically to educational research in addition to its direct practical ramifications. The study modelled a thorough technique for examining intricate educational phenomena in contexts with limited resources by using a mixed-methods approach that combines qualitative insights with quantitative performance data (Creswell &

Plano Clark, 2018). It offers a model for further study in related situations and highlights the need to integrate data from many sources to capture the complex interactions among instructional strategies, student involvement, and learning objectives.

This study filled a well-defined research gap: no thorough empirical study has systematically investigated the changing roles of teachers, their pedagogical adaptations, and the effects on student performance in Guyana's secondary schools, despite global attention to pandemic-driven educational changes. The study ensured that lessons learnt during the pandemic transfer into long-term gains in educational quality and equity by specifically addressing this gap and offering practical findings that are pertinent to researchers, educators, and policymakers.

Moreover, the research emphasized how important it is for society as a whole to comprehend how education has changed as a result of pandemics. Economic growth, social mobility, and national advancement are all significantly influenced by education. The research demonstrates tactics that promote resilience, creativity, and equality in learning by describing how educators and students in Guyana adjusted to previously unheard-of difficulties. These observations, which provide evidence-based recommendations for bolstering educational institutions in crisis and post-crisis situations, are especially helpful for developing countries with comparable rural-urban disparities and resource limitations.

The current study was both essential and timely. It offered a thorough analysis of how teaching strategies were modified, how educators' responsibilities evolved, and how these changes affected student performance both during and after the COVID-19 pandemic. The study filled a well-defined research gap, adds to the body of knowledge, influences policy formation, improves teacher training, and boosts student academic performance. Its conclusions served as a case study for similar educational situations in the Caribbean and elsewhere, and they have urgent ramifications for practice and policy in Guyana.

## 1.8 Research Questions and Research Hypotheses

### ***Research Questions***

***RQ1. What pandemic-induced modifications in educational practice have been sustained in High Schools in Guyana with regard to online education?***

- This inquiry looks for long-lasting changes in educational practices used in online education brought forth by the pandemic and maintained after the pandemic. It seeks to determine which modifications would have become essential to online education and how they affected the learning process. The research examined which online practices continued post-pandemic, rather than just what was used temporarily.

***RQ2. How have the teaching styles of teachers differed in schools of different geographical areas of Guyana?***

- This inquiry explored the geographic differences in Guyana's instructional methods. It seeks to determine if teachers in various locations have chosen different methods as a result of local resources and situations, as well as how geographical location impacts teaching approaches. For this study teaching styles included a wide range of instructional practices. The broad pedagogical approach that educators used, including how they delivered material, engage students, and used educational technology, was referred to as their teaching style for the sake of this study. Guyana has four official geographical areas the Coastal Plain, where over 90% of the residents are found, the Hilly Sand, the Interior Savannah and the Mountainous area. For this research the study would look at the geographical area in these four areas or simplified to rural, urban and interior areas. The rural and urban is found on the Coastal Plains and the interior encompasses the Hilly Sand, Savannah and mountainous areas since these

combined areas have a small portion of the country's population.

**RQ3. How has the changing role of teachers affected the performance of students at the CSEC Examinations?**

- This inquiry delved into the correlation between modifications in pedagogical positions and students' achievement on the Caribbean Secondary Education Certificate (CSEC) Assessments. It aimed to ascertain whether and to what extent changes in instructional strategies have affected students' performance on these important tests.

**RQ4. What changes have the students found in teaching strategies in the classrooms of teachers now compared to traditional methods before the pandemic?**

- The purpose of this inquiry was to get students' opinions on how teaching techniques have changed from conventional approaches to those used during and after the pandemic. It aimed to comprehend the experiences and opinions of students on the efficacy of these novel tactics.

**RQ5. What measures can be put in place to ensure that teachers improve their teaching styles amidst the pandemic?**

- In light of the current pandemic difficulties, this inquiry focused on finding practical ideas and actions that might assist teachers in improving their pedagogical approaches. It seeks to offer helpful suggestions for enhancing instructional strategies and adjusting to brand-new educational realities.

## ***Hypotheses***

***H1. In the classroom, educators would have adopted a more integrated teaching strategy.***

- According to this hypothesis, teachers have adopted a blended learning strategy that blends conventional in-person education with online and digital resources as a result of the pandemic. It suggested that this transformation is indicative of a long-term alteration in educational practices that persisted after the pandemic.

***H2. Since resources are scarce, teachers in the interior still rely mostly on direct teaching.***

- This hypothesis suggested that, owing to limitations such as location, accessibility, and other educational resources, teachers in Guyana's more rural or interior regions continued to use direct instruction techniques.
- According to this hypothesis, students' performance on the CSEC Examinations had improved as a result of the adoption of creative lesson plans and teaching strategies during the pandemic.

***H3. The evolving role of teachers has impacted students' performance on the CSEC Examinations.***

- According to this theory, teachers' adoption of new duties during and after the COVID-19 pandemic—like using technology, providing emotional support to students, and utilizing a variety of teaching techniques—had a discernible effect on student results.
- This hypothesis states that there should be a strong correlation between students' performance on the Caribbean Secondary Education Certificate (CSEC) Examinations and changes in instructional positions.

**H4. The classes are more participatory and dynamic, as determined by the students.**

- According to this hypothesis, students viewed contemporary teaching techniques as being more participatory and interactive than old-fashioned approaches. It implied that modifications to instructional strategies have improved student participation and engagement.

**H5. The utilization of a blended approach and substituted resources would ensure more effective teaching.**

- According to this hypothesis, improving teaching efficacy involves using a blended learning strategy and making use of a variety of resources. It implied that using a variety of techniques and resources improved student learning. Resources such as using virtual laboratories in science classes, and online mediums for online classes.

Examining how the COVID-19 pandemic has affected teaching methods and student results in Guyana was the objective of the study's questions and hypotheses. This study looked at how regional differences, evolving teaching methods, and their effects on student results in an effort to offer significant insights into how educational institutions could adjust to persistent issues. The findings helped provided recommendations for assisting educators and enhancing student learning throughout the post-pandemic phase, in addition to offering information on effective teaching techniques.

## CHAPTER 2: LITERATURE REVIEW

Although the COVID-19 pandemic caused extraordinary disruptions in many areas, education was particularly hard-hit. According to Williamson et al. (2020), institutions were compelled to quickly adapt their teaching and learning strategies due to the instability and uncertainty caused by the abrupt start of lockdowns and school closures. Similar to this, Talidong and Toquero (2020) noted that to continue teaching, educators were forced to change their educational approaches virtually immediately, implementing new resources and techniques. According to Caggiano et al. (2020), these changes were largely made on the fly and were driven more by necessity than by strategic planning. This demonstrated the education system's resilience and fragility in times of crisis.

The acceleration of digital pedagogies during the crisis was a major issue in the literature. The pandemic, according to Moss et al. (2021), greatly accelerated the use of online learning techniques, turning the house into an extension of the classroom. As education grew more dependent on technology-mediated interaction, this change altered the dynamic between teachers and students. According to Talidong and Toquero (2020), in environments that were defined by autonomy and self-direction, students were expected to take on more responsibility for their own learning, while teachers needed to acquire competencies in digital literacy and online facilitation. According to Williamson et al. (2020), the degree of effectiveness of these changes varied based on the technology infrastructure and institutional resources.

Given the stark contrast between urban and hinterland or rural schools in Guyana, the consequences of these changes were most apparent there. In a phenomenological study of secondary school educators in rural Guyana, Bissessar (2022) discovered that between 30 and 60 percent of pupils lacked dependable equipment or internet connectivity, which significantly reduced their use of online modalities. As a result, educators reused low-tech

and analog techniques, including putting notifications on neighborhood bulletin boards, conducting lectures via local radio broadcasts, and handing out printed worksheets at drop-off locations. Although these makeshift tactics showed tenacity, they also brought attention to the serious infrastructure deficiencies that limited distance learning. Long-standing disparities in educational access were reinforced, according to teachers, when they claimed that many pupils from interior or riverine villages were shut out of online communities like Zoom sessions or WhatsApp groups.

Thus, the crisis served as a unifying force as well as a dividing one. Although it sped up technical advancement, it also made inequality worse. While some metropolitan schools were able to make the shift to digital environments somewhat easily, schools in locations with fewer resources encountered significant challenges because of socioeconomic limitations, inadequate infrastructure, and a lack of teacher training. Moss et al. (2021) argued that although the pandemic highlighted the need for flexibility and adaptation, it also exposed the weaknesses of educational systems that were ill-equipped to handle systemic digital distribution.

International and national organizations made an effort to lessen these difficulties. According to a UNICEF report from 2020, Guyana's Ministry of Education used hybrid strategies that included the distribution of protective gear and sanitary facilities, as well as online platforms, printed learning materials, and radio broadcasts. This allowed schools to reopen safely for important exams like the Caribbean Secondary Education Certificate (CSEC) and the National Grade Six Assessment (NGSA). In order to guarantee that learning proceeded even in areas without internet connection, the Ministry gave priority to underprivileged and rural pupils using funding from the Global Partnership for Education. These initiatives demonstrated that the government aimed to integrate various delivery methods to maintain interest rather than only using remote learning as a Band-Aid solution.

However, there was still variation in these strategies' durability and efficacy around the nation. A noteworthy trend became apparent when schools started to reopen: a large number of educators resumed their pre-pandemic methods of instruction. This reversal was ascribed by Caggiano et al. (2020) to institutional inertia, resistance to change, and a propensity among educators to choose routine and comfort above innovation. The general tendency indicated that the pandemic-driven changes were not entirely ingrained in instructional practice, even if some educators kept using some of the digital tools they had implemented during the crisis. This brought up important issues regarding the long-term viability of pandemic-induced modifications and their potential to transform teaching.

The function of teachers was also affected by the reversal. Teachers took on additional duties during the pandemic, including managing virtual classes, curating information, and serving as digital facilitators (Talidong & Toquero, 2020). High degrees of flexibility and ongoing professional development were required for these positions. However, many of these duties decreased when in-person sessions began, and the classroom returned to traditional, teacher-centered teaching methods. This brought to light a significant theoretical issue: were the changes that were seen during the crisis signify a real shift in educational practice or merely a brief departure from long-standing trends?

The persistence, or lack thereof, of creative teaching methods was especially important in the Caribbean setting when considering student learning results. High-stakes tests like the CSEC exams continue to be essential to academic success and advancement in Guyana. Exam preparation was hampered by the pandemic, which also changed teaching methods and, in certain situations, made it harder for pupils to regularly follow the curriculum. Few studies specifically examined whether these adaptations resulted in better exam scores in small states with unequal resource distribution, despite the fact that international literature highlighted the potential of digital tools to continue learning during

school closures (Moss et al., 2021; Williamson et al., 2020). This discrepancy implied that although the pandemic sparked important educational shifts in the near term, it was unclear how it would affect quantifiable outcomes like CSEC scores in the long run.

These worries were supported by evidence from all throughout the Caribbean. Due to a shortage of gadgets, unsupportive family situations, and restricted internet access, students from low-income households and rural areas in Jamaica and Barbados were disproportionately disadvantaged, according to Blackman et al. (2021). According to a regional study of online learning, teacher training in digital pedagogy was still scarce, and many Caribbean systems lacked the previous ICT infrastructure required to support distant learning successfully (Caribbean Development Bank, 2021). In order to maintain enrollment, Caribbean institutions used blended and modularized delivery methods at the tertiary level, according to the Inter-American Development Bank. However, student access and faculty capability remained barriers to efficacy.

These geographical similarities demonstrated that, although being made worse by its distinct topography and rural-urban divisions, Guyana's problems were a part of a larger trend. All of the research pointed to the pandemic as both a disruption and a strengthening of educational standards. On the one hand, it brought in new roles, tactics, and technology while upending long-standing patterns. On the other hand, it exposed the powerful influence of tradition and the institutional impediments that prevented long-term change. This dichotomy was especially noticeable in Guyana, where structural injustices and institutional slowness hindered the adoption of innovations in daily practice, even if the crisis promoted experimentation with distant learning.

The literature showed that the COVID-19 pandemic forced educational institutions and educators to use new tactics, but it was unclear how long-lasting these changes would be. The data indicated that although digital pedagogies increased the number of flexible and

student-centered learning possibilities, many of these practices were dropped when the crisis passed. There is still much to learn about the consequences for student results, especially about the CSEC exams. Therefore, the review emphasized the pandemic's transformational potential as well as the difficulties of maintaining educational change in environments characterized by entrenched habits, resource restrictions, and structural inequity.

## **2.1 Theoretical Framework**

### **Constructivism**

The sudden transition to remote and hybrid learning brought to light the limitations of traditional teaching methods and underscored the need for flexible, student-centered educational options during the COVID-19 pandemic. It was demonstrated that constructivist concepts, which placed a high value on social connection, active engagement, and contextualized knowledge, were especially helpful in overcoming these challenges (Seifert & Sutton, 2009). Strategies like scaffolding and collaborative learning have been widely used in virtual and hybrid environments to support cognitive growth and maintain relevant learning experiences.

Scaffolding, defined by Bruner (1983) as the provision of short-term help that was progressively removed as students attained proficiency, was strongly associated with constructivist philosophy. Scaffolding was crucial in assisting students in overcoming the difficulties of distance learning during the pandemic, which often included asynchronous instructional methods and new digital platforms. Through interactive tutorials, thorough instructions, and virtual office hours, teachers offered controlled supervision that allowed students to progressively gain confidence and independence.

Seifert and Sutton (2009) claim that by gradually reducing support, students were able to actively create knowledge by combining previously learned material with new experiences. For instance, scaffolding in scientific education, aided by online simulations and assisted problem-solving frameworks, made it easier for students to understand complex ideas. Additionally, these digital technologies made formative assessment possible, giving teachers the chance to respond to each student's unique learning requirements and offer customized feedback.

Many pupils felt alone and alienated as a result of the pandemic's disruption of the social components of education. Constructivist pedagogy's core component of collaborative learning addresses these problems by promoting group engagement and knowledge development. The usage of virtual breakout areas, document sharing, and real-time collaboration was made possible by digital platforms like Zoom and Google Classroom. Through the use of these resources, students were able to discuss issues, share viewpoints, and work together to solve difficulties, preserving the social aspect of learning even in the face of physical seclusion.

The importance of social contact for cognitive development was highlighted by Vygotsky's concept of the zone of proximal development (ZPD) (Seifert & Sutton, 2009). Students expanded their understanding within the ZPD through cooperative learning with professors and peers who offered advice and criticism. Humanities students, for example, participated in group discussions on current events and historical event analyses, enhancing their critical thinking and communication abilities through peer contact.

By focusing on contextual relevance and active involvement, project-and problem-based learning (PBL) has also shown efficacy during the pandemic, in line with constructivist principles (Steff & Gale, 2012). PBL inspired students to research real-world problems, such as how the pandemic affected their communities and how to come up with workable solutions. Collaboration, communication, and the use of critical and creative thinking were all encouraged by these undertakings. Despite the difficulties of remote learning, teachers maintained student engagement by facilitating PBL with well-defined goals, materials, and organized assistance.

Long-standing disparities were also brought to light by the move to remote and hybrid learning. For instance, students' engagement was severely limited in Guyana's rural and hinterland areas due to a lack of gadgets and internet connectivity (Bissessar, 2022). These gaps were lessened by constructivist techniques like differentiated scaffolding, which allowed teachers to tailor support to each student's unique situation. Collaborative learning used the diverse views and abilities of group members to further promote inclusivity. In order to ensure fair involvement and acknowledgement of each student's effort, some students really did research while others concentrated on design or presentation.

In addition to influencing student learning, constructivist ideas also had an impact on educators' professional adaptation. Professional learning communities (PLCs) provided teachers with chances to exchange tactics, work together to solve issues, and evaluate their work. Constructivism's focus on mutual aid and shared knowledge was reflected in these networks. Additionally, educators who participated in scaffolded professional development programmes gained the abilities necessary to combine digital technology and constructivist methodologies. Despite previously unheard-of difficulties, they were able to develop inclusive and stimulating learning environments because of this reflective technique.

The pandemic experience showed that constructivist approaches might be used for purposes other than crisis management. Because they placed an emphasis on actively creating information and integrating new experiences with pre-existing cognitive structures, scaffolding and collaborative learning have also been demonstrated to be beneficial for both in-person and blended learning environments (Seifert & Sutton, 2009). While scaffolding techniques provided individualized teaching that addressed a range of learner requirements, collaborative tools also showed the ability to foster a feeling of community across multiple educational environments.

Furthermore, critical thinking, problem-solving, and practical application—skills essential to success in the twenty-first century—were encouraged by constructivist tactics. Constructivist education gave pupils a framework for navigating complicated and quickly changing contexts by making sure that learning was both transformational and relevant. In the end, the pandemic demonstrated the ongoing importance of constructivist educational ideas. In addition to being successful in maintaining student interest during remote and hybrid learning, strategies like scaffolding, collaborative learning, and project-based inquiry also set the stage for more creative and robust educational systems in the wake of the pandemic.

Constructivist methods provided a framework for developing inclusive, adaptable, and meaningful learning experiences by placing a strong emphasis on social interaction, contextual relevance, and active involvement. As schools worked to rebuild and adapt, these realizations were especially important in situations like Guyana, where structural injustices necessitated flexible, student-centered solutions. This study's design and emphasis were directly influenced by the constructivist framework. Constructivism was a helpful perspective to study both the adoption and abandonment of innovative methods, as the research sought to investigate how educators in Guyana's secondary schools modified their instructional tactics during and after the COVID-19 outbreak. The pedagogical changes educators reported implementing in reaction to school closures and technology difficulties were closely connected with ideas like scaffolding, collaborative learning, and problem-based inquiry.

By highlighting the significance of inclusive participation and tailored assistance, the framework also sheds light on access discrepancies, especially in rural and hinterland schools. The study was able to evaluate the instructional changes that took place as well as their effects on student engagement, learning outcomes, and readiness for important tests like the Caribbean Secondary Education Certificate (CSEC) by firmly establishing the analysis in constructivist principles. In order to ensure that the investigation stayed focused on how knowledge was actively constructed, mediated by technology, and sustained (or not) in the post-pandemic educational landscape, this theoretical orientation consequently guided the formulation of the research questions as well as the mixed-methods approach used.

## Connectivism

Siemens (2004) defines connectivism as a digital-era learning theory that integrates aspects of chaos, self-organization, networks, and complexity theories. This method recognizes that learning occurs in a rapidly developing environment where decisions are based on shifting presumptions. It presents the case that technology is an integral aspect of life and that, especially for first-year students, it might serve as a helpful model for academic guidance. This article examines connectivists' notions, their use in academic counseling, and their implications for modern education.

Connectivism is a philosophy that sees knowledge as a network and is predicated on the idea that learning is the act of seeing patterns. Siemens (2005) emphasized that learning, defined as information that can be applied, may occur in settings other than an individual, such as a database or an organization. The theory argues that linkages across specialized information sets are valuable and should be prioritized above our current level of knowledge since they enable us to learn more.

Elieson (2013) asserts that prior knowledge is necessary to acquire new information. College administrators and academic counselors have to compete with students for their time as they balance their academic growth with other commitments like friends, family, and employment. The complexity of the learning environment, which is impacted by several variables such as media, technology, and peer pressure, is reflected in this rivalry. Students create a dynamic interaction between their current and new understandings by bringing academic support and prior knowledge about certain majors.

According to Siemens (2005), connectivism is a learning theory appropriate for the digital era, where technology has a big influence on people's daily lives and educational processes. The theory incorporates ideas from theories of self-organization, networks, chaos, and complexity. Connectivism stresses that learning may happen outside of the individual and

is driven by the ability to integrate disparate knowledge sources, in contrast to constructivism, which concentrates on internal cognitive processes. AlDahdouh et al. (2015), who verified that learning is a process of pattern recognition and knowledge is regarded as a network, support this viewpoint.

With the increasing influence of technology on education, students must adapt to new pedagogies. In addition to traditional sources, they now process data from social media posts, online publications, and other digital inputs. According to Pasquini (2013), students' learning is significantly impacted by the digital environments in which they study. Connectivism acknowledges that decision-making is a learning process and that it is shaped by the accessibility of technology and digital gadgets.

According to connectivism, students should successfully combine concepts, theories, and prior knowledge. Advisors are extremely important in helping students with this process. Even students who seem to know what they want to accomplish might not be aware of all the linkages between various knowledge fields, according to Siemens (2004). Tinto (1998) promoted a community model of academic organization that encourages participation among students and professors through connected, shared learning experiences. Advisors might start these conversations by questioning the decisions and presumptions made by their students.

Siemens (2008) asserts that network links in online or virtual settings facilitate modern learning. Large volumes of information, including blogs, news stories, journal papers, and multimedia material, are stored via Internet technology. According to connectivism, learning is supported by both synchronous and asynchronous learning nodes within a network. Through these links, one may obtain trustworthy information from a variety of sources, which can then be shared, evaluated, and added to one's body of knowledge.

Connectivism's central tenet is that people acquire higher-order thinking abilities when they can distinguish between credible and long-lasting sources of knowledge. Higher-order

thinking is defined by the Center for Advancement of Learning and Assessment (CALA) as requiring persistent, self-monitoring, open-minded, and adaptable attitudes. This is consistent with the connectivist theory, which holds that people learn through a variety of intermediates, including peers, parents, teachers, and digital platforms.

Another well-known learning theory is behaviourism, which stresses how incentives and penalties may change behavior. On the other hand, connectivism emphasizes the capacity to handle and arrange data in the digital era. Online collaboration tools support time management and organizational skills by teaching students how to explore the wealth of information accessible.

The example of chemistry instruction in Guyana serves as an illustration of how technology is affecting education. Chemistry had a pass rating of 60.94% in 2021. Teachers were compelled by the pandemic to use conventional teaching techniques like "chalk and talk," even in distance learning scenarios. Students' performance in practical laboratories and level of involvement were both severely impacted by this strategy. Teachers ran online labs, but because students were unable to actively engage, they became disinterested.

Teachers gained expertise in using virtual laboratories via professional development, which enables students to engage and comprehend subjects more fully. The pass rate rose to 66% by 2023 (Ministry of Education, 2024). The use of digital tools in the classroom demonstrated that technology improves learning when it is in line with students' needs and generational preferences, even if some schools lacked complete access to the required equipment.

Teachers served as mentors and guides for students, assisting them in becoming capable agents of their own lifelong learning and personal growth from a connectivist standpoint (Chickering, 1994). Teachers offer resources to help students make educated decisions and guide them through their academic journeys. Through these exchanges,

students are inspired to make connections between their digital and physical surroundings to generate new knowledge. Teachers connect academic studies with practical applications by challenging students' presumptions and fostering confidence in their decisions.

According to Lowenstein (2013), advisers were now aware of how critical it was to support students in gaining a personal understanding of how the world works, how information is obtained and evaluated, and how these understandings relate to their own lives. This method was consistent with connectivism, which sees learning as an ongoing process of integrating and linking many sources of knowledge.

A strong foundation for comprehending learning in the digital era is provided by connectivism. It highlighted how crucial technology and networked relationships are to the process of learning. Through the incorporation of concepts from the theories of chaos, networks, complexity, and self-organization, connectivism offers a complete framework for academic guidance and instruction.

The multitude of digital sources that impacted students nowadays means that counselors and teachers must help them link and integrate this knowledge. The approach emphasizes the value of information literacy and higher-order thinking abilities in enabling students to successfully negotiate the complexity of today's information environment. The example of Chemistry education in Guyana shows how integrating technology into the classroom may improve student learning. Advisers are essential in assisting students in gaining the knowledge and self-assurance necessary to make wise choices on their academic and career paths.

Connectivism recognizes that education is a dynamic, socially and technologically driven activity. It emphasizes the necessity of modifying teaching strategies and support systems to address the changing digital environment, providing insightful information for advisers and educators alike. Connectivism aids in the development of meaningful knowledge

and equips students for lifelong learning by encouraging linkages between various information sources. It is crucial to go further into the guiding ideas and real-world applications of connectivism in order to better elaborate on its roots and ramifications. Elieson (2013) made the observation that an individual's capacity to learn new things depends on the body of information they already possess. Academic counselors must possess the ability to recognize and elaborate on historical data. They must help students draw connections between the new information and what they already know. Integration is crucial to giving students a complete understanding of the disciplines they have chosen to study.

Digital literacy is one of connectivism's fundamental ideas. Since we live in a digital age, students must be able to traverse a range of online platforms and discern reliable information from dubious sources. Advisors ought to place a strong emphasis on helping students acquire digital literacy skills by teaching them how to utilize social media, databases, and search engines efficiently for academic work. Students who possess this competency are able to use technology to further their education and careers.

Connectivism promotes lifelong learning, in which people look for new information and abilities all their lives. Advisors should encourage students to have an attitude of inquiry and constant growth. Encouraging them to take use of webinars, online courses, and other digital learning opportunities keeps them up to date with the always changing body of knowledge in their domains. Siemens (2008) asserts that education is a networked endeavor. Advisors ought to support students in creating and sustaining a strong network of learning. Peers, teachers, business professionals, and online groups may all be a part of this network. Students may acquire various views and remain up to speed with the latest trends and advances in their areas of interest by interacting with a varied set of people.

Connectivism's emphasised on individualized learning routes is one of its advantages. Advisors ought to collaborate with students to design individualized lesson plans that

complement their talents, interests, and professional objectives. Better learning results result from this individualized strategy, which makes sure that students are motivated and engaged. Connectivism emphasized how crucial teamwork is to the educational process. Study groups, internet forums, and group projects are examples of collaborative learning possibilities that advisors can encourage. In addition to improving learning, these cooperative exercises support students in gaining critical abilities including problem-solving, communication, and cooperation.

Although connectivism has many advantages, there are drawbacks as well. Ensuring fair access to technology is a major concern. Not every student has the same degree of access to the internet and digital gadgets. In order to close the digital gap, advisors and educational institutions must help students who might not have access to the required technology by offering those tools and assistance. Because of the speed at which technology is developing, advisors and students need to be flexible. Advisors who wish to give current and pertinent advice should keep up to speed on emerging technology and educational trends. This flexibility guarantees that the learning process stays relevant and successful.

The following real-world examples showed how connectivism can be used in academic advising: A teacher uses video conferencing software to run a virtual advice session. The adviser uses screen sharing to show the class how to access academic resources for research. Additionally, the teacher connects the students to online groups relevant to their major and invites them to sign up and take part in conversations. This method not only gives the student quick guidance but also gives them the freedom to access digital resources on their own.

A teacher works with a student to develop a digital portfolio that highlights their projects, extracurricular activities, and academic successes. The student can update this portfolio on a personal website regularly. The teacher stresses the value of presenting the

student's work professionally while guiding them through the usage of various technologies to develop and manage the portfolio. This digital portfolio is a great tool for networking and job applications.

Senior students assist first-year students through a peer mentorship programmes that is organized by a teacher. One of the features of the programmes is an online forum where mentees may exchange materials, ask questions, and work together on tasks. To make sure that conversations are constructive and fruitful, the adviser keeps an eye on the platform. For both mentors and mentees, this peer learning network strengthens the learning process and promotes a sense of community.

A teacher talked with a student about the value of lifelong learning and assists them in finding online programmes and certifications that are pertinent to their professional objectives. Along with guiding course selection and timetable management, the adviser also connects the student to online learning environments such as Coursera and LinkedIn Learning. Through the encouragement of lifetime learning practices, the teacher makes sure the student stays involved and keeps improving.

A thorough framework for comprehending and improving learning in the digital era is offered by connectivism. Its focus on lifelong learning, digital literacy, and networked learning fits quite nicely with what today's students require. Academic advisers are essential in assisting students in navigating this challenging environment because they help them form relationships, acquire digital literacy skills, and cultivate an attitude of lifelong learning.

Connectivism's potential to revolutionize education is demonstrated by its useful uses in academic advising. Teachers can greatly improve student engagement and achievement through the integration of digital resources, peer learning networks, and tailored learning paths.

In conclusion, connectivism recognizes that education is a dynamic, socially and technologically driven activity. It emphasized the necessity of modifying teaching strategies

and support systems to address the changing digital environment, providing insightful information for advisers and educators alike. Connectivism aids in the development of meaningful knowledge and equips students for lifelong learning by encouraging linkages between various information sources.

### ***Transformational Leadership***

High schools in Guyana faced particular difficulties as a result of the COVID-19 pandemic's significant effects on the global education system. These difficulties have included anything from adjusting to online teaching techniques to dealing with notable learning losses, especially in underdeveloped and remote locations. As key players in the educational system, teachers have seen their duties change as a result of these upheavals. Given this, the idea of transformational leadership becomes a useful framework for examining how teachers' roles are changing and the tactics needed to meet the demands of the post-pandemic educational environment.

The hallmark of transformational leadership is its focus on inspiring and encouraging people to accomplish group objectives that go beyond their own self-interests. According to Odumeru & Ogbonna (2013), transformational leaders cultivate a feeling of dedication to common goals while elevating the values and maturity of their followers. In the context of education, this leadership approach offers a way to deal with the systemic issues caused by the pandemic, especially by encouraging educators to be flexible, creative, and cooperative.

The sudden shift to online and hybrid learning settings was one of the biggest shocks brought on by the pandemic. This shift exposed significant gaps in digital literacy and access to technology for many Guyanese educators. Giving educators the attitude and abilities they need to handle these new demands makes transformational leadership applicable in this situation. In addition to being educators, teachers who adopt transformational leadership

concepts are change agents who can help their students and peers navigate the unknowns of online learning. Such educators should, for example, make the effort to become knowledgeable about and proficient in new technologies, assist their colleagues in adjusting to these resources, and cultivate a resilient school culture.

The emphasis on promoting professional development is another essential component of transformative leadership. According to Bass (2014), transformational leaders encourage their teams to realize their greatest potential by placing a high priority on their growth. This viewpoint is especially crucial for Guyana's educators, who frequently work in settings with few resources. Teachers may be empowered to use cutting-edge pedagogical practices, close learning gaps, and meet the varied needs of their students through professional development programmes that are in line with transformational leadership concepts. For instance, educators may work together to create lesson plans that use active learning strategies to keep students interested in spite of the difficulties the pandemic has caused.

The necessity of attending to educators' and students' emotional and psychological health has also been highlighted by the pandemic. Transformational leaders are renowned for their capacity to establish a welcoming and inclusive atmosphere where people feel appreciated and inspired. In the context of education, this means that educators cultivate a feeling of community in their classrooms and schools. Teachers may assist their students in navigating the fears and uncertainty caused by the pandemic by fostering trust and exhibiting empathy. This strategy is especially important in Guyana, where the pandemic's socioeconomic effects have been felt most keenly, increasing the demand for caring and encouraging teaching methods.

Additionally, transformational leadership stresses the need of having a common vision. This vision inspires people to collaborate toward shared objectives by giving them a feeling of purpose and direction. In Guyana's high schools, where a variety of cultural,

economic, and geographic elements influence the educational environment, a common goal might enable educators and students work together to overcome the obstacles the pandemic has presented. For example, a school-wide commitment to tackling learning loss may entail educators working together to identify students who are at risk, provide focused interventions, and track their progress. In this instance, transformational leadership offers the structure for uniting the school community around these objectives.

The focus placed on questioning the status quo and promoting innovation is a characteristic that sets transformational leadership apart. According to Clarke & Wild (2011), transformational leaders create an atmosphere of constant development by encouraging their staff to think critically and creatively. This viewpoint is especially pertinent for Guyana's educators as they work to address the pandemic's long-term effects on their students' academic performance. To re-engage students and improve their educational experiences, teachers who embrace transformational leadership ideas are likely to try out novel teaching strategies like project-based learning or the use of interactive digital technologies.

The pandemic has also brought attention to systemic injustices in the educational system, especially in rural regions where resources and qualified teachers are few. By encouraging a culture of cooperation and shared accountability, transformational leadership provides a way to resolve these disparities. By combining resources, mentoring less seasoned colleagues, or pushing for legislative reforms that give equal access to education first priority, educators who demonstrate transformational leadership may collaborate to create solutions that address these gaps. The idea of transformational leadership offers an insightful perspective for analyzing how the duties and responsibilities of Guyana's teachers changed both during and after the pandemic. It highlights how crucial it is to prioritize the welfare of both teachers and students, cultivate a culture of cooperation and creativity, and inspire and motivate educators to rise to new challenges. Teachers can improve the resilience and equity

of the educational system and raise the standard of education in Guyana by incorporating transformational leadership ideas into their work. A doctoral research study on the evolving role of teachers throughout the pandemic must take transformational leadership into account because of its significance.

### **Socio-Cultural**

The importance of social interaction in language learning is emphasized by the interactionist perspective. The social constructivist theory of Vygotsky serves as its foundation. Vygotsky's zone of proximal development (ZPD) hypothesis describes how socially mediated interactions help language students pick up new languages.

According to Niedzielski & Preston (2003), the social integrationist viewpoint holds that language learning takes place inside a dynamic system. Children use this approach to indicate to their parents the kinds of language experiences they require in order to improve their language abilities. This mutual exchange creates a basic yet supporting communication framework that allows for efficient communication.

Vygotsky's sociocultural theory (SCT) of mind serves as the foundation for developmental psychology and is recognized as one of the most comprehensive accounts of mental development available today (Lantolf, 2008; Vygotsky, 1998). This hypothesis is based on three fundamental concepts: *(1) the role that social conditions have in influencing an individual's mental health; (2) the importance of genetic or developmental studies in understanding mental functioning; and (3) human activity's mediating role (Wertsch, 1991, p. 25)*. Vygotsky's SCT has significant implications for understanding concepts like knowledge and learning.

The central assumption of Vygotskian philosophy is that knowledge is not just the result of individual mental processes but is also significantly influenced by social

interactions. This process of knowledge formation is impacted by both tangible and immaterial things and is mediated by society (Lantolf, 2004). Learning, according to Vygotsky, is primarily a social process in which interactions between persons with varying levels of knowledge contribute to the development of new information.

Vygotsky's developmental theories emphasize the unification of behavior and awareness, sometimes known as the integration of conduct and consciousness. This concept highlights the importance of social interaction and intelligence in human development. Vygotsky (1987) differentiated clearly between sociohistorical and biological stages of development. He argued that biological growth alone cannot result in new behaviors or social interactions.

Four distinctive elements characterize Vygotsky's (1987) theory of development. It first assumes the development of a novel psychological framework or novel connections between the different mental processes. According to Vygotsky, perception, memory, and thinking become intertwined throughout childhood ontogenesis instead of existing independently. For instance, the process of remembering and thinking interacts to produce logical memory. This hypothesis of Vygotsky's is characterized by the interdependence of cognitive functioning.

Vygotsky's theory of development, according to Eun (2008), is distinct from modern theories and even from frameworks based on social interaction, such as social learning theory. By arguing that psychological processes are inherently social, Vygotsky goes beyond just recognizing the significance of social contact in development. He saw awareness, social interaction, the mind, and conduct as components of a unitary system. While acknowledging the importance of social contact, some theories saw the process of transformation as more instantaneous and spontaneous. On the other hand, Vygotsky characterized internalization—the shift in social behaviour from external to internal—as a drawn-out, multifaceted process involving the involvement of several people in practical acts.

Vygotsky defined internalization as the process by which social interactions become internal cognitive processes. This is not an automated or quick change. Rather, it is a methodical process in which students actively engage in social relationships. Through these interactions, students receive the scaffolder assistance they need to gradually absorb new cognitive skills.

Vygotsky's theories have important practical ramifications for educational approaches. His focus on the social aspect of learning implies that social interactions and cooperative learning ought to be essential components of the educational process. As more experienced individuals who offer direction and support within the learner's zone of proximal development, teachers and parents play important roles. This support enables students to complete activities that they would not be able to do on their own, which promotes cognitive development.

This approach is especially applicable to families and schools in the Caribbean. Schools that have involved parents typically see improved student achievement and fewer disciplinary problems. To provide students' needs priority, Parent Teacher Associations (PTAs) collaborate with the Ministry of Education at these schools. They assist educators in organizing learning experiences for students, such as field trips and exhibits, which help them become more knowledgeable and self-reliant.

Active parental participation in school is consistent with Vygotsky's theory that learning is mostly based on social interactions. PTAs frequently lead initiatives that produce engaging learning environments in Caribbean schools. These exercises foster social and emotional development in addition to intellectual development. PTAs, for example, may plan neighbourhood get-togethers where children can mingle with a varied crowd, expanding their social circles and improving their communication abilities.

Moreover, PTAs' involvement in planning educational activities emphasizes the value of hands-on learning. For instance, field excursions offer students practical experiences that

enhance their comprehension of academic subjects. These excursions provide students the chance to link what they have learned in the classroom to actual situations, strengthening their understanding via hands-on experience. This supports Vygotsky's theory that learning is most successful when it is linked to significant, practical experiences.

Additionally important in helping students develop their individuality and self-confidence are exhibitions and other school activities. Students can show their work, share their knowledge, and get criticism from peers and adults by taking part in these activities. Vygotsky believed that social contacts were crucial for cognitive growth, and this process of giving and getting feedback is similar to such exchanges. Students get improved communication skills, learn to reflect on their work, and take into account many points of view via these exchanges. Positive school cultures are influenced by supportive school communities and active parental participation in addition to the benefits to academic performance. When educators and parents work together, they foster a supportive and coherent learning environment that is advantageous to all students. By fostering a collaborative environment, teachers may make sure that students feel appreciated and encouraged, which can improve their enthusiasm and involvement in class. Better academic results and general student well-being might follow from a healthy school culture.

Furthermore, Vygotsky's ideas stress how crucial cultural environment is to learning. Integrating cultural heritage and community values into the educational process might improve learning experiences in Caribbean communities since these factors are strongly embedded. Schools may establish inclusive settings that respect and honor each student's background if they acknowledge and promote cultural variety. This method supports the view of Vygotsky that learning is a process that is placed in society and culture.

In conclusion, the significance of social contact in the learning process is emphasized by both the interactionist theory of language acquisition and Vygotsky's social constructivist

method. Examples of how cooperative learning environments help students' linguistic and cognitive development include the internalization hypothesis and the zone of proximal development. The intricate processes of human development and learning are made simpler by Vygotsky's emphasis on the interconnectedness of social and cognitive progress.

This approach, which emphasizes the advantages of community support and active parental engagement in encouraging student development, is especially helpful in educational contexts. Through the integration of Vygotsky's ideas into educational practices, educational institutions may establish stimulating learning environments that facilitate students' holistic growth. This method equips students for success in both their personal and academic lives by fostering social and emotional well-being in addition to improving academic ability.

## **2.2 Historical Perspective of Education in Guyana**

Since Guyanese culture has its origins in colonial times under British authority, education has been a fundamental aspect of the community. As evidence of its dedication to high standards in education, Guyana has received many awards from the Caribbean Examination Council (CXC) over the years. This dedication dates back to the years 1835–1845 when missionary groups dealing with freed slaves received the "Negro Education Grant" from the Imperial Government. The main concerns of the Colonial Office and these missionaries were the general public's theological and moral instruction. Because of this, secondary education and teacher preparation were first disregarded, with the majority of the first schools being housed in houses of worship. The teachers were frequently catechists, clergymen, their spouses, or, in an uncommon instance, someone who had taught before.

The educational system of Guyana, which still has many elements from the days when it was British Guiana, is currently managed by the Ministry of Education and its regional departments. The CXC member nations that are part of the English-speaking Caribbean

Community (CARICOM) have a system that is comparable to theirs. The Ministry oversees the eleven districts that make up the nation and establishes rules for curriculum, financing, and academic standards. The capital, Georgetown, is regarded as a distinct district (District 11), with the remaining 10 districts following the administrative and physical boundaries of the nation.

Given the historical, social, and economic context of the nation, scholars, legislators, and educators have all expressed interest in Guyana's educational progress. The literature, especially that of the colonial era, provides extensive documentation on the evolution of the educational system in Guyana. Roopnarine (2004) emphasized the significance of mission schools in basic education and notes that the Society for the Propagation of the Gospel in Foreign Parts (SPG) was instrumental in the establishment of these establishments and in establishing the foundation for subsequent advancements in education. Significant changes were made to Guyana's educational system after independence.

Five years and nine months is when compulsory schooling starts, and it lasts until the student is sixteen. To fulfill these criteria, the majority of students attend public schools; however, a small number of private institutions also offer education at different levels. But in Guyana, homeschooling is essentially nonexistent.

With the exception of private schools, education in Guyana was free from kindergarten through university until the mid-1990s. Even though public education is still supported from preschool through secondary school, many post-secondary schools now charge tuition. This change is indicative of a break from Guyana's socialist orientation in the 1970s when the country aimed to provide access to education for everyone. In that period, single-sex schools were transformed into coeducational establishments, and private and religious schools were integrated into the public system.

These modifications were part of a larger post-colonial CARICOM movement that

sought to provide an education that was in line with the goals and legacies of independent countries. Because of its responsibilities to the CXC, Guyana's educational standards and evaluation procedures are now in line with regional norms. Guyana is among the top developing nations with an Education Index score of 0.943, according to the UN Human Development Report. It comes in third in the Caribbean, behind Cuba and Barbados, and second in South America behind Argentina. Although Guyana has succeeded in achieving the MDG of universal primary education, the Department for International Development (DFID) notes that there are still issues with delivering high-quality secondary education.

Guyana's educational system frequently lacks contemporary technical equipment like interactive whiteboards and multimedia materials since it is one of the poorest countries in the Western Hemisphere. Basic resources are severely lacking in many schools, especially in the fields of science and technology, which might put students at a disadvantage when compared to their classmates in the same region.

The 2007 Education Law has been revised by the Guyana Parliament to provide a more comprehensive education system in response to these ongoing difficulties. However, Guyana continues to allow physical punishment in schools in violation of its international duties under conventions such as the UN Rights of the Child. A thorough analysis of the Education Act of 1976 and the post-independence period is given by Singh (1989), who also highlights initiatives to create a national education system, increase access to basic schools, and give priority to vocational and technical education.

Inequalities and chronic issues in Guyana's educational system have been the subject of several scholarly investigations. Regarding equality, quality, and access, UNESCO's 2015 Education for All Global Monitoring Report highlights the necessity of sustained efforts to deliver high-quality education, especially in underprivileged areas. An important turning point in Guyana's educational history was the founding of the University of Guyana in 1963.

The importance of higher education for a country's growth is emphasized by scholarly research from both local and foreign scholars, which frequently calls for more funding to meet the demands of a shifting labor market and economy.

The nation's path from colonial oppression to independence and its continuous attempts to create a more equal and inclusive educational system are reflected in the historical development of education in Guyana. The founding of mission schools, the elimination of slavery, and post-independence changes targeted at achieving universal education are important historical turning points. Guyana is still working to provide more people with access to high-quality education today because it understands how important education is to the country's future and how it may promote social and economic growth.

In Guyana in the early era of colonization, missionary work was closely linked to education. The newly liberated people were to be instilled with moral and religious ideals by missionary groups and the British colonial authorities. To sustain these missionary schools, the Imperial Government's "Negro Education Grant" from 1835 to 1845 was essential. The majority of the funds were given to Christian missionary groups, such as the SPG, who started Guyana's first mission schools.

These mission schools, which were housed in churches or other places of worship, were frequently crude. Few of the teachers had official expertise in education; most were catechists, clergy members, or their wives. Secondary education and practical disciplines were generally ignored due to this emphasis on religious teaching. However, these pioneering schools set the stage for a growing educational system that reached a wider range of people with basic reading and numeracy skills.

In the late 19th and early 20th centuries, the colonial authority started to take an increasingly active role in education. The colonial government began to get increasingly involved in education as the demand for a better-educated labor force increased. Still, there

was little investment made in secondary and vocational training, with the major focus being on basic education. Alongside missionary schools, government-funded schools were established during this time, albeit regional differences in educational quality and accessibility were notable.

When Guyana attained independence in 1966, the country's educational system underwent a dramatic transformation. The new administration placed a high priority on education as a tool for economic growth and nation-building. During this time, several significant changes were introduced to increase educational access and raise standards. The nationalization of private and religious schools was one of the biggest changes. The goal of this action was to develop a more cohesive and equal educational system. Along with free kindergarten through university education, the government implemented socialist programmes throughout the early years of independence. The goal of this strategy was to guarantee that all Guyanese children could attend school and to remove financial obstacles to education.

The Ministry of Education, which was established to oversee the educational reforms, gained prominence as the primary organization in charge of developing policies, designing curriculum, and implementing standards. The educational system was divided into eleven districts, each headed by Georgetown, the nation's capital. This administrative structure aims to facilitate better coordination and monitoring of learning programmes across the country.

Curricula in Guyanese schools were significantly altered after independence. The new curriculum aimed to represent the country's cultural past and feeling of national identity while also preparing students for participation in the global economy. More material about Guyana and the Caribbean was added to courses in social studies, geography, and history.

Additionally, assessment procedures were changed to conform to regional guidelines established by the Caribbean Examinations Council (CXC). With the advent of the Caribbean

Advanced Proficiency Examination (CAPE) and Caribbean Secondary Education Certificate (CSEC), consistent benchmarks for assessing student performance throughout the Caribbean were made available.

Despite these changes, there are still issues with the Guyana school system. Due to budgetary constraints, the government's ability to sufficiently fund and equip schools has resulted in disparities in educational quality and access. Rural and hinterland communities are particularly hard hit by inadequate infrastructure, a teacher shortage, and a lack of educational resources.

The 2015 UNESCO Education for All Global Monitoring Report highlighted these issues and stressed the need for further efforts to bridge gaps in access and quality. The study underlined the importance of educational fairness and called for targeted actions to improve educational outcomes in underserved areas. The establishment of the University of Guyana in 1963 marked a momentous shift in the history of education in the country. The institution wanted to help national development by doing research and providing higher education to Guyanese students. The University of Guyana has expanded throughout the years in both size and student body, making a major contribution to the development of the human resource base of the country.

Scholarly investigations by Singh (1989) and others have underscored the function of postsecondary education in fostering societal progress and financial prosperity. These results underline how much more money for postsecondary education has to be allocated to adjust to the demands of a shifting economy and boost the country's standing internationally. The Guyanese government has strengthened the education sector with several legislative and policy actions in recent years. The 2007 Education Law was revised to address new issues and update the legislative framework controlling education. The updated legislation contains clauses on technology use in the classroom, inclusive education, and special needs education.

The goal of creating an education system that is more accessible and egalitarian is still the major focus as Guyana looks to the future. To guarantee that every student has access to a top-notch education, the government keeps funding curriculum development, teacher preparation programmes, and educational infrastructure. To address the demands of a varied economy, efforts are also being made to enhance vocational and technical education as well as incorporate technology into classrooms.

The historical evolution of education in Guyana is a reflection of the nation's struggle to achieve educational equity and inclusivity as well as its transition from colonial domination to independence. Significant turning events such as the abolition of slavery, the establishment of mission schools, and post-independence initiatives aimed at attaining universal education demonstrate the nation's commitment to education as a means of advancing socially and economically. Guyana is still striving to increase the number of people who have access to high-quality education because it recognizes the potential benefits to social and economic advancement as well as the importance of education for the nation's future. Through comprehending the past and tackling present issues, Guyana may persist in enhancing its educational accomplishments and strive towards a more promising future for its whole populace.

### **2.3 Conceptual Framework**

This study's conceptual framework incorporates a number of theoretical viewpoints that together shed light on how teaching responsibilities and pedagogical practices changed in Guyana both during and after the COVID-19 outbreak. Every theory offers a different perspective: While the Socio-Cultural theory emphasizes the impact of contextual and community factors in educational change, Constructivism stresses learner-centered engagement and the co-construction of knowledge; Connectivism emphasizes digital

interactivity and networked learning; and Transformational Leadership focuses on motivation, innovation, and school culture. The study also makes use of Beatty's (2019) HyFlex Model, which offers a useful schema for putting into practice adaptable, technology-mediated learning environments, and Rogers' (2003) Diffusion of Innovations Theory, which describes how new educational technologies and practices are adopted, in order to bridge these pedagogical and leadership frameworks. These theories work together to provide a cohesive conceptual framework for comprehending how Guyana's educators have adjusted to and are still navigating the changing educational environment.

The way these frameworks interact illustrates how multifaceted educational transformation is presently (*See Figure 2*). The pedagogical movement toward active, student-centered, and digitally connected learning is framed by constructivism and connectivism together. The notion of transformational leadership highlights the need of visionary leadership in maintaining innovation by relating this pedagogical shift to the organizational and motivating aspects of educational settings. The socio-cultural viewpoint makes sure that these changes are understood in the context of Guyana's unique social, cultural, and infrastructure realities rather than being examined in an abstract manner. By describing how educators, educational institutions, and communities embrace or reject technological change, Rogers' (2003) Diffusion of Innovations Theory connects theory and practice. Beatty's (2019) HyFlex Model puts these ideas into practice by showing the prerequisites for successful hybrid delivery. These frameworks offer a logical way to look at how pedagogical, institutional, and systemic factors interact to influence post-pandemic education in Guyana.

Since the COVID-19 pandemic has had a significant influence on educational practices, it is important to comprehend how these modifications align with the body of current research. Several historical studies offer insightful information about a range of education-related topics that were directly impacted by the pandemic, especially when it comes to topics

like technology integration, curriculum adaptation, teacher roles, remote learning, and student learning outcomes.

The difficulties of distance learning constitute an important field of study. An example of research that explores the obstacles to successful online learning is Dong et al.'s "The Challenges of Remote Education during the COVID-19 Pandemic" (2020). This study draws attention to problems such as restricted access to technology, challenges in sustaining student involvement, and the widening digital gap brought on by the pandemic. The abrupt switch to remote learning compounded these difficulties, which is why this study is especially important for comprehending the pandemic's wider effects on education.

Important background is also provided by the issue of technology integration in education, which was well-researched even before the pandemic. The research "Technology Integration and the Role of the Teacher" by Ertmer & Ottenbreit-Leftwich (2013) examined the challenges and solutions associated with integrating digital resources into instructional practices. Their research prepared the way for examining how online learning platforms were swiftly and widely adopted under COVID-19, forcing teachers to adjust to new technology requirements quickly.

The pandemic also significantly altered the responsibilities that educators play in society. In his 2012 study, "The Changing Role of Teachers in the Digital Age," Schleicher explored how educators' roles are changing in a society that is becoming more and more digital. This study provides a framework for comprehending how the pandemic further altered the roles of educators by requiring them to take on new duties like overseeing virtual classes and providing support to students in a distance learning setting.

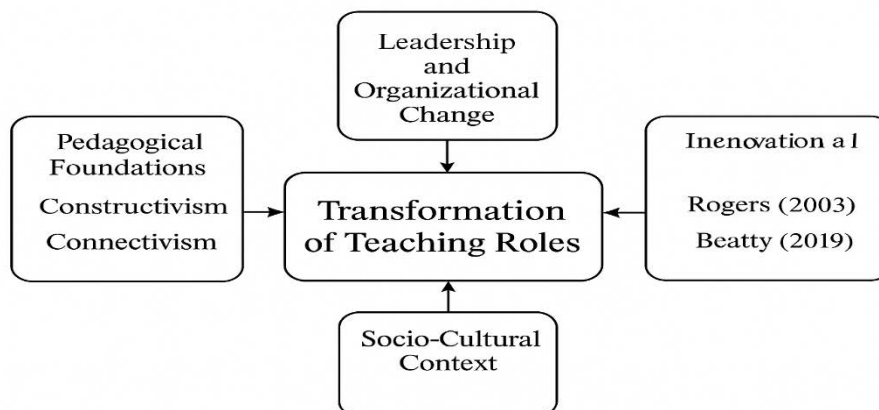
The modification of curricula in response to international crises is another crucial field of research. In his article "Curriculum Adaptation in Response to Global Crises," Pinar (2010) offered information on how curricula are changed in schools to handle important global

issues. This research is particularly significant in understanding how educational institutions changed their delivery methods and curriculum to better suit remote learning settings in reaction to COVID-19's disruptions.

Lastly, the impact of disruptive events on student learning outcomes has been the main focus of earlier research. Harris (2011) looked at how disruptive events, such as natural disasters, affect students' ability to study in "The Effect of Disruptive Events on Student Learning Outcomes." This research offers a helpful lens through which to assess the COVID-19 pandemic's impacts on education, particularly with regard to how student success was influenced by extended school closures and the move to remote learning. All of these research together offer a solid basis for comprehending how educational practices and teacher responsibilities changed throughout the COVID-19 pandemic. We may better understand the changes in education brought about by this worldwide crisis by looking at these earlier studies in addition to the plethora of research listed in this literature review.

## Figure 2

*Figure 2: Conceptual Map of Theoretical Frameworks*



## ***Remote Learning***

The unprecedented shift from traditional in-person training to remote learning was necessitated by the COVID-19 pandemic. This change was prompted by the urgent need to adhere to public health guidelines while maintaining educational continuity. As a result, remote learning quickly became the primary method of instruction, thanks to the development of digital platforms, the Internet, television, radio, and other media (Kamanetz, 2020; Sun et al., 2020). This worldwide movement had a profound effect on teaching and learning going forward and changed how education was delivered and viewed by both educators and students.

There have been several obstacles as well as excitement around the quick adoption of remote learning. Teachers have to swiftly pick up new skills and modify their pedagogical techniques to fit an online learning environment after being abruptly thrown into a completely different educational setting. This involved finding out how to run online classes, interact with students via video chat, and efficiently use digital media for content delivery. This change was unsettling for a lot of teachers as it meant reevaluating how instruction might be provided efficiently even in the absence of students.

Notwithstanding these challenges, the pandemic spurred innovation in the educational sector. To quickly adapt to distance learning, educators and educational institutions were compelled to look into new methods of instruction and learning. During this time, innovative teaching techniques emerged and new technologies were incorporated into the classroom. To better meet the demands of a varied student body, educational institutions, and teachers started experimenting with blended learning models that included synchronous and asynchronous teaching techniques. More flexibility and personalization in the learning process were made possible by the widespread use of digital technologies including interactive learning management systems, online collaboration platforms, and video conferencing.

The pandemic brought about several important developments, one of which was a greater focus on student-centered instruction. Students were frequently expected to assume more responsibility for their learning in a remote learning setting, with less direct educator monitoring. This change forced educators to reconsider how they taught, putting more of an emphasis on helping students become digitally literate, autonomous students, and critical thinkers. To provide students with more meaningful and pertinent learning experiences, educators began implementing project-based learning, flipped classrooms, and other student-centered teaching strategies.

The pandemic also brought attention to how crucial digital inequality and technological access are. Significant differences in students' access to the resources and technologies required for online education were made clear by the move to remote learning. It was challenging for students from disadvantaged families to participate in remote learning in several areas of the globe due to their lack of technology, stable internet access, or cozy living quarters. The necessity for lawmakers and educational institutions to make efforts to close these gaps and guarantee that all students have the chance to profit from online learning top priority was highlighted by the digital divide.

Numerous projects were started to facilitate remote learning during the pandemic in response to these difficulties. Governments, non-governmental organizations, and businesses in the private sector worked together to give educators and students the tools they required to be successful in a distance learning setting. This includes giving teachers access to gadgets like computers and tablets, increasing internet connectivity, and providing professional development opportunities to help them become more adept with technology. Many educational institutions have also created online courses and open-access materials to facilitate study even when schools are closed.

Conventional assessment techniques were also reexamined in light of the quick

transition to remote learning. Since students were studying at home, teachers had to find new methods for evaluating their progress and comprehension. As a result, more formative assessment techniques were used, allowing for ongoing feedback and reflection. Examples of these practices include digital portfolios, peer evaluations, and online tests. These methods promoted a more comprehensive understanding of student accomplishment by stressing the value of learning as an ongoing process as opposed to a succession of stressful tests.

The knowledge gained from the pandemic's distant learning experience is probably going to have a long-lasting effect on education. Even though many institutions are now offering in-person education again, it is anticipated that digital tools and online learning approaches would continue to be integrated. The pandemic has shown how technology may improve education and open the door for more adaptable, hybrid learning methods that can meet the requirements of specific students. The results of remote learning have also demonstrated how vital it is to prepare educators and students for the challenges of the digital age, in which technology is playing an increasingly significant role in the classroom.

The COVID-19 pandemic presented opportunities as well as challenges for a quick and substantial shift to distance learning. Educators must quickly adopt a new teaching approach, pick up new skills, and research innovative teaching strategies. Notwithstanding these challenges, the pandemic acted as a potent stimulant for innovation in education, propelling the adoption of cutting-edge pedagogical approaches and technology that would undoubtedly influence the course of education in the future. The experiences of remote learning would offer important insights on how education might change to suit the changing demands of students in a digital era, as schools continue to navigate the post-pandemic world.

## ***Pandemic Challenges***

The pandemic of COVID-19 presented a rare chance for revolutionary reform in schooling. The abrupt transition to remote learning and the mass closing of schools forced educators, students, and legislators to reconsider conventional teaching methods. This worldwide crisis highlighted the critical need for more adaptable, robust, and flexible techniques and revealed serious weaknesses in the current educational systems.

One of the largest challenges faced during the pandemic was the rapid adoption of remote learning technology by educators who had little prior experience with digital tools. Schools and other educational institutions were forced to quickly develop and deploy digital platforms and resources in order to facilitate remote teaching and learning (Kamanetz, 2020; Sun et al., 2020). This abrupt shift upset established practices, requiring educators and students to move outside their comfort zones and prompting a review of educational goals and methodologies.

The pandemic brought disparities in access to technology and the internet to light, highlighting the digital divide. Students from underprivileged backgrounds found it difficult to adjust to the abrupt switch to online instruction, especially those who lived in rural regions or in low-income homes. Many were unable to fully engage in remote education because they lacked the gadgets or dependable internet connections required. This discrepancy made already-existing educational disparities worse and brought up crucial concerns about the justice and inclusion of digital learning programmes.

Notwithstanding these difficulties, the pandemic presented educators with a hitherto unheard-of chance to show that they are capable of bringing about significant change. Teachers and students had to reconsider how education was provided and evaluated, as well as adjust to new learning contexts, as traditional classroom settings and evaluation techniques were disturbed. This disruptive time allowed for the creation of new educational resources and

technologies as well as the testing of creative teaching techniques.

Teachers, specifically, shown exceptional ingenuity and perseverance when handling these difficulties. Several teachers used innovative teaching strategies in response to the challenge of preserving student interest and learning objectives in a virtual environment. They experimented with novel approaches to content delivery, interactivity, and progress monitoring. Some educators implemented flipped classrooms, in which students worked on assignments and collaborative projects outside of class and participated in class discussions. Some improved the learning process by utilizing interactive technology, gamification, and multimedia materials.

A wider adoption of digital technologies in education can also be attributed to the need to adjust to distant learning. Educators who had previously exhibited reluctance or unfamiliarity with technology started to see its potential to improve student learning. Given the increasing ingraining of digital literacy and technology into schooling into teaching methods, this shift in viewpoint is probably going to have a lasting impact.

The pandemic also made people reevaluate the goals of education. The old emphasis on rigorous curriculum and standardized testing was overturned, creating a chance to highlight other areas of learning including critical thinking, creativity, and problem-solving. Some educators used this opportunity to create more comprehensive, student-centered curricula that emphasize the development of skills that are necessary for navigating through a rapidly changing world.

### ***The Evolution of Teaching Roles***

According to Broughton et al. (2002), typical teaching methods provide insufficient opportunity for students to interact with one another and primarily focus on educator instruction. Furthermore, Kuzu (2007) claims that it is dependent on the popular perception

of education. Accounting has traditionally been taught using traditional, or somewhat more sophisticated, teacher-centered approaches rather than modern, student-centered applications and processes. Lectures or conversations between the teacher and the student have often been used to transmit this kind of knowledge. Additionally, there could be variations in how much the instructional tactics employed affect active learning (Cottel & Millis, 1993; Bonner, 1999).

Students' expectations of their professors in the classroom have significantly changed, and access to a vast array of information on any subject has become easier thanks to the Internet (Hargreaves 2003). Teachers no longer hold the same importance as the main knowledge source as a result. A modification of the teacher's position was spurred by the modernization of graduation requirements for universities as a consequence of demand from the social, intellectual, and commercial groups (Selevich et al., 2015). In the contemporary world, experts should be able to lead by example, make decisions in novel situations, and independently gather, assess, and analyze information (Chodasová & Tekulová, 2015).

Traditional education consists of lectures that are "the centerpiece of instruction, where students passively absorb pre-processed information and then regurgitate it in response to periodic multiple-choice exams" (McCarthy & Anderson, 2000, p. 279a). Therefore, a teacher's primary duties are to transfer information and administer assessments. According to Jaques (1992), this teaching approach is out of step with the goals and context of current education since it promotes students to learn just at the surface (passive) level rather than the deep (active) level.

Due to the change in the perspective of modern professionals and the growing ease of access to knowledge, education is now defined as "experiences in which students are thinking about the subject matter" as they interact with the teacher and one another (McKeachie, 1999). Teachers are increasingly participants and organizers in their students' instruction rather than

mere carriers (Clapper, 2009). According to Sutherland & Bonwell (1996), active learning tactics include a variety of cooperative classroom tasks, from five-minute cooperative problem-solving exercises to lengthy simulations. According to Gelisli (2009), teachers and students both participate actively in the learning process nowadays.

Furthermore, because of the crisis, teachers and students experienced levels of stress and anxiety never before seen, underscoring the significance of social and emotional learning (SEL). The isolation of distant learning and the wider uncertainty surrounding the pandemic underscored the necessity for educational systems to attend to students' emotional well-being. As schools realized how important mental health is to students' overall achievement, they started implementing Social and Emotional Learning programmes more deliberately.

In summary, despite its difficulties, the COVID-19 pandemic acted as a stimulus for reconsidering and transforming education. It offered a chance for creativity and adaptability while exposing the shortcomings of conventional educational institutions. There is hope for long-lasting change, as seen by the quick uptake of remote learning technology, the innovative solutions offered by educators, and the reworking of educational objectives and approaches. It is crucial to apply the lessons learnt and keep developing more robust, fair, and adaptable educational institutions that can better serve the needs of all students as the globe moves past the pandemic.

### ***Correlation with Existing Research***

This study employs a comprehensive methodology to establish links between its findings and previous research on the pandemic's effects on education. Through a review of technological integration, curricular adaptation, and distance learning, the research contributes to the discussion of how the COVID-19 pandemic has affected education globally.

The topic of the curriculum adaptation framework has been thoroughly researched in the literature up to this point. Numerous studies have demonstrated how fast curricula in schools throughout the world need to adapt in order to accommodate the shift to remote learning. By offering particular insights into how Guyanese educators modified their teaching practices in response to the pandemic, this study expands on previous findings. The study, for example, supports earlier studies emphasizing the value of curricular flexibility in emergency situations. It illustrates how teachers in Guyana modified the curriculum to meet the particular difficulties brought about by the pandemic, such as restricted access to materials and variable student participation levels, in addition to making the necessary adjustments to fit an online format.

One additional significant area where this study agrees with other research is the use of technology in the classroom. The adoption of digital technology in education was accelerated by the pandemic, a process that has been thoroughly studied in the past. By looking into the specific technology utilized in Guyanese schools and how they are used contributed to the corpus of knowledge by examining how instruction's effectiveness was impacted. Prior studies have frequently concentrated on the advantages and difficulties of digital learning, such as the digital divide and easier access to educational materials. This study supports previous conclusions while providing fresh insights into the realities of deploying technology in a setting with limited resources, such as Guyana. For instance, it talks about how teachers have to strike a balance between making use of the tools at their disposal and making sure that every student, regardless of socioeconomic status, could participate fully in the learning process.

Another area in which the results of this study align with previous research is distance learning, which was essential during the pandemic. Numerous international studies have examined the difficulties in sustaining student engagement in a distance learning setting,

frequently highlighting problems like decreased teacher-student connection, an increase in home distractions, and the psychological effects of isolation. This study validates these difficulties in the Guyana setting, demonstrating how the abrupt switch to online instruction increased already-existing disparities and introduced new difficulties for educators and students alike. By looking at the creative ways Guyanese teachers used to keep students interested—like adding more interactive web resources and adapting their teaching methodologies to fit the needs of distance learning—it also offers fresh perspectives.

Through its connections to these well-established research domains, the study adds to the current discourse about the role of education in the post-pandemic world. One such discussion is on how long-lasting the changes the pandemic has caused. There is a debate among experts over the potential long-term impacts of the shift to digital and distant learning brought on by the pandemic. Some contend that these changes are just transitory and would reverse once normalcy returns. This study contributes to the conversation by offering data from Guyana, where certain changes—like the adoption of digital tools—may become sustained while others—like some methods of remote instruction—may be more ephemeral.

The topic of equity in education is one that this research also discusses. The pandemic has brought attention to and, in many cases, increased the gaps in education that already existed. This study provides suggestions for improving educational equity going forward by shedding light on how these discrepancies manifest themselves in various settings by concentrating on a developing nation like Guyana. It highlights the need for policies that help disadvantaged students and address the digital gap, echoing the concerns of earlier studies, and offers context-specific solutions that may be used in similar situations.

This study adds to the body of literature by presenting fresh viewpoints from the Guyanese setting and coordinating with other studies on how the COVID-19 pandemic has affected schooling. The study looks at curriculum adaptation, technological integration, and

distant learning from a localized point of view, which helps us better understand the issues and changes that teachers and students faced throughout the pandemic. The study's conclusions highlight the value of adaptability, creativity, and equality in education—themes that would probably hold as people continue to negotiate the post-pandemic environment. This study's association with previous research confirms its applicability and contributes insightful new information to the continuing conversations regarding education's future.

The study's conclusions have several wider ramifications for education going forward, especially in settings like Guyana where resources are scarce and educational disparities are severe. These ramifications go beyond the COVID-19 pandemic's immediate consequences and provide information about long-term tactics that might improve educational efficacy, equality, and resilience.

## ***Student-Centered Learning***

### **Active Learning and Constructivism**

Nowadays, active learning methods are widely used and commonly connected to constructivism. Even though it wasn't a pedagogical instruction, many constructivism supporters developed real-world applications of the idea in the context of learning. Constructivist learning is another term that some scholars use to describe active learning (Cooperstein & Kocevar-Weidinger, 2004). As such, this conceptual framework ought to serve as the foundation for defining the roles that educators play in active learning. According to the constructivist approach, new experience builds on prior knowledge and conceptions follow behaviour rather than precede it (Brainerd & Piaget, 2003).

Learning advances through "authentic" tasks (Cooperstein & Kocevar-Weidinger, 2004) (students' activities should reflect those they would come across in real life). In this situation, the new teacher's role is more obvious. Teachers should no longer act as a storehouse

of knowledge, even though they are still at the core of their students' learning. They are in charge of creating an environment where students and teachers may work together to learn. Therefore, it is essential to comprehend the new teacher's viewpoint for learning to proceed successfully at each stage of training.

Constructivism in education is based on epistemology, a philosophical theory of knowing that addresses the logical categories of knowledge (Gale & Steff, 2012). Students learn by "constructing" information via their experiences. Teachers must comprehend children's thoughts as well as how to help them develop them, even if the behaviorist approach to education may help comprehend what children do (Seifert and Sutton, 2009).

Piaget's Cognitive Development Theory (1971), which Lev Vygotsky developed, is the foundation of constructivism. Seifert & Sutton (2009) demonstrated this theory's development. The ideology of constructivism places great emphasis on sociocultural learning, highlighting how students acquire knowledge via adult interactions, more advanced peers, and cognitive tools, ultimately forming mental constructs within the zone of proximal development. Seifert & Sutton (2009) state that Bloom (1983) and other educational psychologists built upon Vygotsky's theory to establish the fundamental idea of instructional scaffolding. This concept suggests that learning is facilitated by the social or informational environment, which serves as a scaffold that is gradually removed as the learning becomes internalized.

This shows that the students are evolving based on the social construct of society. The pandemic changed the way that students interacted and learned, and it is only fitting that the research shows that the methodology has to change as well.

### **Bloom's Taxonomy in Active Learning**

The higher levels of Bloom's taxonomy are better suited to describing these higher-

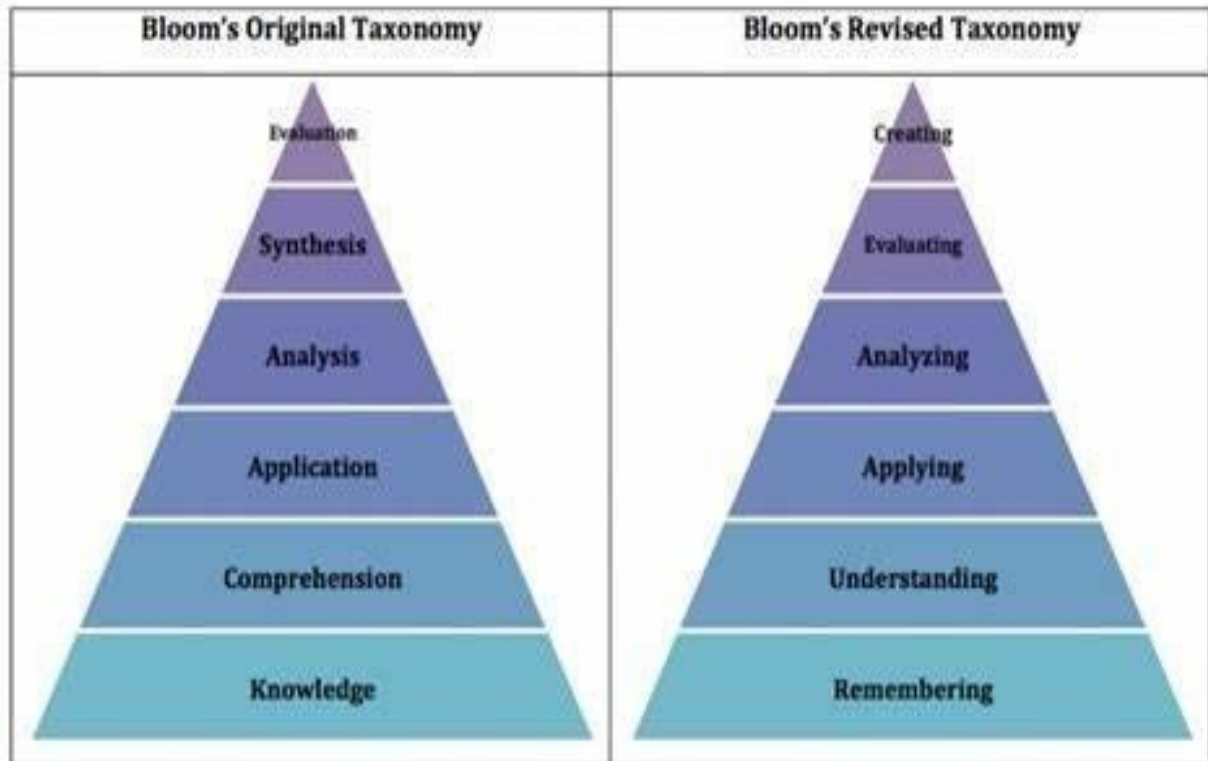
order tasks. The educational system requires a unique type of pedagogy, such as critical pedagogy, to foster active learning (Jodersma, 1999). Many educational institutions use the traditional mode of instruction, which entails that a teacher instructs students in their classrooms. The educator is the topic, and the students are merely objects as they hear the teacher speak and occasionally ask questions about the curriculum. Students at all levels may complete the passive portion of learning in this classic educational method, which simply calls for approaches like lecturing, assigned textbook readings, and viewing movies or demonstrations. But in order to engage in higher-order thinking abilities across a range of tasks, students must participate in active learning (Fobes & Kaufman, 2008).

In the modern educational setting, one of the most popular methods for creating learning objectives is based on Bloom et al.'s Taxonomy of Cognitive Domains (1956). Created in 1956, the taxonomy consists of six stages of cognition. Among these skills are understanding, application, knowledge, synthesis, analysis, and evaluation. Similar to the more comprehensive constructivist approach, the basic tenet of Bloom's taxonomy is that the knowledge that teachers want their students to acquire may be grouped in a hierarchy based on complexity (Huitt, 2003).

According to Anderson (1990), a former student of Bloom, who revised and enhanced the taxonomy to reflect relevance to 21st-century work for both students and teachers, Anderson & Krathwohl (2001) remarked. The three main areas in which Anderson changed the taxonomy were terminology, structure, and focus (Forehands, 2005). The original language was maintained by Anderson by changing the nouns in Bloom's categories to verbs. Anderson renamed the categories for memory, understanding, and creation from knowledge, comprehension, and synthesis. Anderson also modified the synthesis sequence, renamed it Create, and placed it at the apex of the triangle. As a result, Anderson and Krathwohl (2001) altered Bloom's taxonomy to apply, analyze, appraise, and create.

### Figure 3

Figure 3 Comparison of Bloom's Original Taxonomy (1956) and Revised Taxonomy (2001)



A research by Wells et al. (2008) looked at how effective a virtual learning environment was in a graduate accounting programmes. A set of students who utilized Blackboard, a proprietary online virtual learning platform, as their virtual tool had their perspectives examined in this study. Evaluating the lectures, exercises, supplemental materials, and forum discussions was the primary goal of the research. The introduction of a virtual learning environment in the accounting classroom was positively welcomed by the students, leading to improved learning outcomes and improved communication between the teacher and students. Due to their absence from the classroom, working students also displayed good attitudes.

## ***Technology Integration in Education***

For underdeveloped nations where a lack of resources and in-service teacher education make change more difficult to implement, the transition from teaching fundamental digital skills to a knowledge-based curriculum including more computer science ideas, including programmes, presents significant obstacles. Introducing computing in classrooms presents several obstacles for teachers, including topic knowledge and confidence (Sentance & Csizmadia, 2017). This was identified primarily in Guyana's context, the challenges of the integration of technology were mainly a lack of resources and the effective usage of technology in the classroom. Teachers of IT and computing in two regions of Guyana participated in two full-day seminars in March 2018 that each had three sets of exercises. Teaching computers without a computer, using the Microbit, and using pedagogical methods to teach programmes are just a few examples (Sentance et al., 2020).

Technology shouldn't completely replace in-person instruction, students retorted. According to Breen et al. (2003), who studied virtual learning environments, students favoured touch and one-way communication over interactive modes. A study by Basioudis & DeLange (2009) examined how students viewed their experience using the Blackboard platform. Technology use is increasing throughout a variety of industries in the modern world, including education. Technology is used by people in their daily chores and activities. Those who seek to aid students in their academic learning and comprehension employ technology in the classroom. Students frequently use technology to finish their assignments, projects, and reports. People use the internet to research a variety of things whenever they need to.

People begin learning how to use computers and other technology in their early years, according to a study. As students become older and enroll in secondary schools, senior secondary schools, and higher educational institutions, they acquire knowledge and abilities. Utilizing technology has made it possible for people to complete their chores and activities in

a more manageable way and provide the required results (Kapur, 2019).

### ***Diffusion of Innovations Theory (Rogers, 2003)***

Everett Rogers' Diffusion of Innovations Theory (2003) offers a fundamental framework for comprehending the gradual spread of novel concepts, methods, and technological advancements inside a social system. According to Rogers, diffusion is the process by which an innovation is shared among members of a social system via particular routes, leading to either its acceptance or rejection. According to the hypothesis, adoption is influenced by five essential characteristics: trialability, observability, complexity, compatibility, and relative advantage. These characteristics establish whether or not people believe an innovation to be beneficial, consistent with current values, easy to use, testable in a restricted setting, and evident in its results.

The diffusion framework is especially useful for studying how educators and educational institutions embrace new pedagogical technology in the setting of education. Rapid innovation in teaching methods was required during the COVID-19 pandemic due to the global transition to remote and hybrid learning. The degree to which these practices were institutionalized following the pandemic, however, differed greatly depending on the setting. By highlighting how social influence, institutional preparedness, and personal perception affect adoption patterns, Rogers' theory contributes to the explanation of these variances.

The applicability of Rogers' (2003) theory in post-pandemic education is still being supported by recent research. According to Trust and Whalen (2020), educators' opinions about the relative benefits and institutional support of online learning had a significant impact on whether or not they kept using digital tools after emergency remote teaching. Similar findings were made by Zawacki-Richter (2021) and Aboagye & Yawson (2022), who discovered that educators' technical self-efficacy and congruence with their preexisting

pedagogical views were critical variables in maintaining the adoption of hybrid learning. These results imply that diffusion depends on perceived instructional value and contextual appropriateness in addition to technology accessibility.

Rogers' theory offers a helpful perspective through which to examine how Guyanese educators dealt with the transition from emergency remote teaching to longer-term hybrid approaches. The paradigm emphasizes that the degree of institutional support, peer influence, and perceived congruence with local teaching realities are all important factors in the effective transmission of educational innovation, in addition to access to digital infrastructure. In order to assess the sustainability and variety of hybrid instructional techniques among Guyanese secondary school teachers, this study uses the Diffusion of Innovations Theory as a guiding lens.

Building on the theoretical underpinnings of Rogers' (2003) Diffusion of Innovations Theory, it is evident that the degree to which innovations are successfully incorporated into current institutional and pedagogical frameworks determines how long hybrid and technology-mediated education can last. Frameworks like Beatty's (2019) HyFlex Model show how innovations can be methodically used in classroom settings, while Rogers' model explains why teachers choose them. The HyFlex paradigm emphasizes adaptability, accessibility, and learner agency in a design-based approach to hybrid education that is consistent with diffusion principles. To place the current study into the developing conversation on post-pandemic educational change, the following part examines Beatty's concept and relevant research on hybrid learning models.

### ***Beatty's (2019) HyFlex Model***

One of the most well-known models for creating and overseeing hybrid learning environments is the HyFlex Model, which was created by Brian Beatty in 2019. HyFlex, a

portmanteau of "hybrid" and "flexible," refers to a method of course design where students can decide, session by session, whether to participate synchronously online, asynchronously, or in-person. According to Beatty (2019), this adaptability enables educational institutions to accommodate the various demands of students while preserving academic continuity in the face of disruptions like natural catastrophes or public health crises. Since the model is based on the equivalence principle, learning objectives ought to be the same for all participation methods.

Learner choice, equivalence, reusability, and accessibility are the four pillars upon which Beatty's HyFlex Model is built. Together, these guidelines seek to establish a smooth educational process that does not favor one form of involvement over another. In actuality, this calls for thoughtful course design, preparedness for technology, and strong institutional support. Nevertheless, the COVID-19 pandemic's worldwide experience showed that many educational systems, especially in developing nations, adopted hybrid models reactively rather than proactively, frequently lacking the tools and training required for full HyFlex operation.

The potential and difficulties of implementing Beatty's paradigm in developing nations have been highlighted by recent studies. While HyFlex designs can encourage inclusivity and student autonomy, Raes (2022) highlighted that when technology infrastructure is inadequate, they also run the risk of exacerbating inequality. Similarly, Iglesias-Pradas et al. (2021) discovered that HyFlex adoption can result in unequal learning outcomes and a greater workload for teachers if staff are not properly trained. These findings are especially pertinent in the Guyanese setting, where there are still differences between coastal and hinterland schools.

The investigation of hybrid teaching techniques in Guyana is based on a proven pedagogical paradigm that prioritizes flexibility and learner agency, according to the study's

placement within Beatty's (2019) framework. Therefore, the HyFlex Model offers a conceptual framework for analyzing how teachers' post-pandemic adaptation techniques conform to or deviate from internationally accepted hybrid education criteria.

When combined, they offer a logical conceptual framework for comprehending the adoption and application of hybrid teaching methods. Using elements like relative advantage, compatibility, and institutional support, Rogers' framework clarifies the social and cognitive processes by which educators choose whether to adopt new educational technology. In contrast, Beatty's methodology operationalizes these adoption choices into tangible design principles that facilitate adaptable and fair instruction delivery. In this way, the HyFlex model illustrates how innovation can be successfully implemented in reality, while diffusion theory explains why educators embrace or reject it. By combining these theories, this study examines how institutional preparedness, technology availability, and teacher perspectives all affect the sustainability and continuity of hybrid learning in Guyana's secondary education system.

Both frameworks have drawbacks despite their strong explanatory capacity. Rogers' (2003) theory has been criticized for its inadequate sensitivity to socioeconomic disparities impacting adoption, especially in developing countries, and its linear model of diffusion (Greenhalgh et al., 2004). Likewise, Beatty's (2019) HyFlex model requires strong institutional support and technology infrastructure, which are frequently inequitably distributed among educational institutions (Raes, 2022). As a result, this study contextualizes both theories, acknowledging that differences in digital access, institutional policy, and teacher readiness act as mediators in the spread and execution of hybrid education in Guyana. This flexible strategy guarantees that local educational realities and global theoretical models are significantly in line.

## 2.4 Roles and Responsibilities of Educators

The main objectives of educators' responsibilities and obligations are to provide students with knowledge and information to improve their quality of life overall. They significantly improve the whole educational system in addition to assisting students in becoming moral and ethical adults. A successful educator must be knowledgeable about all pertinent subjects. In addition to ensuring that students know the material, they must ensure that they grasp the ideas. They must also possess the knowledge and abilities required to provide the information logically and systematically. One of the essential elements of a classroom is control. Leading educators are required to direct and manage a sizable function inside educational institutions with a high degree of freedom to ensure the proper creation, delivery, and assessment of educational programmes. Leading educators ought to make substantial contributions to the development of laws that influence classroom instruction and learning. An effective educator immediately affects and influences the achievement of academic goals. They are responsible for implementing one or more of the goals listed in the strategic plan (Roles and Responsibilities Teaching Service, 2017).

In addition to imparting knowledge and information on academic subjects to the students, teachers are the ones who play a critical role in developing the overall educational system. According to Harrison & Killion (2019), educators' primary duties include the following:

### ***Resource Provider***

Teachers assist by providing their coworkers with educational materials. This group includes textbooks, journal articles, notes, websites, papers, and other teaching resources. When new teachers are employed by educational institutions, they need assistance and support to successfully carry out their work tasks. As a result, mentoring new educators is one of the most important duties of experienced educators. They give them resources and instruct them

on the numerous facets of educational establishments. By doing this, individuals may significantly help in achieving their work responsibilities in an orderly manner as well as their educational aims and objectives (Kapur, 2019). Teachers in Guyana would have previously faced resource constraints, but the pandemic made it harder for various schools to have the same materials so that students could follow the same curriculum, especially for schools that are tucked away in the interior and remote from conveniences like gadgets and the internet.

### ***Instructional Specialist***

An instructional expert is someone who provides colleagues with sufficient knowledge on how to properly implement teaching strategies. It is necessary to use effective teaching and learning techniques. In addition, they have to be in keeping with academic subjects, grade levels, and children's needs and expectations. For instance, while teaching students how to solve math problems, teachers must use writing skills. Verbal explanations of mathematical concepts are insufficient for students. Because of this, educational specialists need to have a solid understanding of the methods and approaches that are suitable for various academic concepts. Getting opinions and suggestions from superiors and coworkers would also aid in achieving the intended outcomes (Kapur, 2019). The pandemic would have brought about easier access to academic and professional development for teachers. This was to increase the skillset of teachers in the classroom for the betterment of the children in Guyana.

### ***Curriculum Specialist***

A curriculum expert must be knowledgeable about content needs. Additionally, they must comprehend how to use the curriculum in lesson preparation, evaluation, and the interrelationships between its many components. These are required to ensure the consistent and efficient use of curriculum and instructional techniques. The expertise of curriculum

specialists makes it feasible to utilize common pace charts, share tests, and agree on standards and norms. The curriculum must be created with the students' grade levels and learning preferences in mind, according to teachers (Kapur, 2019). Professional development sessions and training programmes offered during the pandemic would have aided in the expansion of teachers' knowledge. However, this was only so in some cases, but lacking mainly in the Humanities departments of the school.

### ***Supporter of the Classroom***

Teachers are seen as the cornerstone of the educational institution. They have to make sure to think of unique answers and ideas when carrying out their duties as instructional assistants. These ideas and methods include lesson plans, teaching-learning tactics, evaluation strategies, activity planning, and assisting students in resolving issues, especially those that may arise while attempting to create goals and objectives and achieve desired academic achievements. Making sure that students are motivated to learn and that the resources they need are available are two ways that teachers may promote learning in the classroom (Kapur, 2019). Teachers at Guyana's high schools found it difficult to oversee every aspect of the classroom while following Ministry of Education guidelines. Teachers now have the primary responsibility for implementing and carrying out reforms in the classroom due to the changes brought about by the pandemic.

### ***Performance Evaluation***

The next step is to evaluate how much the students have learned and if the teaching-learning approaches have been effective in assisting them after the teachers have instructed the class utilizing lesson plans. As a result, performance evaluation describes the use of strategies and plans to gauge student achievement. At all levels of education, organizing tests,

assignments, presentations, contests, and other events is one of the most popular techniques for evaluating student performance. When teachers witness their students performing well on these assessments, they believe they have successfully implemented the teaching-learning strategies and are greatly aiding the students' conceptual comprehension. On the other hand, when students face difficulties in their academic pursuits, educators not only motivate them to put in more effort and focus on their studies, but also modify the method of teaching and learning (Kapur, 2019).

Within the framework of professional growth, teachers modify, enhance, and supplement their instructional competence and conduct, as well as undergo personal and occupational transformation. According to Kalin (2006, p. 174), a teacher "...is committed to continuous professional development and working with others (colleagues), is aware of the connection between one's development and the development of students, and sees its role also outside the class: it builds the connection with people in the local community and society at large, with management bodies and researchers."

Last but not least, the teacher is a complete person in the classroom and an authority in their subject as well as pedagogy and psychology. Only after taking into account both factors can we talk about teachers. The claim made by the authors that "teachers who are otherwise exceptional experts in their profession are not and cannot be able to plan and prepare didactically-methodical adjustments of the subject contents themselves, this is appropriately trained" (Murak et al., 2011, p. 28) is insufficient.

A methodology that has been used for many thousands of years is teaching and learning. However, there has been little change in higher education during the past 600 years. In the twenty-first century, the number of graduates serves as our benchmark for education. Even when we attempt to link education with work, such a measure does not connect education to actual life. Traditional education endured for 600 years, commencing in the

Middle Ages, without undergoing substantial alterations. The current conventional method of schooling in the twenty-first century is not efficient. Many international evaluations of the effectiveness of higher education are heavily impacted by the rise in university enrollment. According to figures from the United Nations Educational, Scientific, and Cultural Organization, those in higher education made up 29% of the population in 2012, up from 19% in 2000.

The abrupt start of the pandemic and the subsequent school closures compelled educators and educational establishments across to innovate and adjust. These changes were implemented as soon as the circumstances demanded it. Sun et al. (2020) and Kamanetz (2020) claim that remote learning swiftly became well-liked in many educational institutions, including schools. The Internet, traditional post offices, television, radio, and other media have all caused schools to change how they instruct their students. For varying lengths of time, remote learning took the role of regular classroom instruction, regardless of the result. The teachers were quick to react and enthusiastic about the modifications made to the way the classes were taught. With clarity and broad backing, the UN states that "this crisis has stimulated innovation within the education sector" (2020, p. 2). Numerous indications point to the COVID-19 pandemic as a once-in-a-generation opportunity for significant change. At first, almost every school was impacted by the pandemic because of its pervasive nature.

As a result, it gives teachers and students the chance to collaborate in order to reconsider the type of education we need as opposed to the rigid, antiquated model that we so desperately want to adopt. Second, educators demonstrated their ability to influence global change. Owing to the pandemic, schools had to close, which allowed parents, students, and educators to educate in completely different settings. Without much forethought or prior digital experience, governments, educational systems, and institutions of higher learning offer remote learning and teaching (Kamanetz, 2020) and are supported by Sun et al. (2020). Third,

most of the routine processes and tests that govern education were either abandoned or used sparingly when schools were closed. There were no longer any high-stakes tests or traditional accountability exams. Education was given the ability to quickly adjust to the new situation.

### ***Teacher Role***

According to Broughton et al. (2002), the traditional teaching method primarily concentrates on teacher instruction and does not provide students with enough opportunity for engagement. Furthermore, Kuzu (2007) asserts that it is founded on the conventional view of education. Instead of adopting the more modern student-centered approaches and applications, accounting has historically been taught using traditional, or slightly more sophisticated, teacher-centered methods. Traditionally, lectures or debates in which both the teacher and the student are physically present have been the method used to impart knowledge. Additionally, as noted by Cottel & Millis (1993) and backed by Bonner (1999), there may be differences in the degree to which the instructional styles employed influence active learning.

The efficiency of a virtual learning environment in a postgraduate accounting course was examined by Wells et al. (2008). In particular, the study examined the perspectives of a group of students who utilized the virtual tool Blackboard, a proprietary online virtual learning environment. Examining the lectures, supplemental materials, exercises, and forum discussions was the study's main goal. In accounting classes, students responded well to the introduction of a virtual learning environment. It enhanced the learning process and made it easier for students and educators to communicate.

The fact that working students were not required to be physically present in the classroom for instruction also contributed to their favorable evaluations. Students argued that in-person training should not be utilized in place of technology. It was demonstrated in research by Breen et al. in a virtual learning environment that students preferred physical engagement and unidirectional communication with the tool over interactive mode (2003). More recently, Basioudis & DeLange (2009) investigated the students' perceptions of their utilization of the Blackboard platform mentioned above.

### ***Instructional Methodologies***

According to Albrecht & Sacks (2000), a variety of sophisticated teaching strategies were required to enhance the accounting discipline's educational component. It is crucial to concentrate on fostering the fundamental abilities and competencies—such as written and verbal communication—that students require in order to handle accounting problems in actual business contexts if we are to successfully modernize and enhance conventional curriculum and teaching methodologies. Both the theoretical knowledge and the practical skills that the market and business need should be considered in this.

Arquero-Montano et al. (2004) evaluated how two instructional strategies were used in diverse settings to promote the growth of competencies and skills, including accounting problem-solving, and communication. In particular, the experimental group focused on more complex situations whereas the control group focused on simpler and more process-oriented topics. The control group's total points were distributed more equally, but there was no other noticeable difference between the two groups' total points gained according to the test findings. Cullen et al. (2004) conducted questionnaire research on accounting role-play and problem-solving from the viewpoint of students using a real case study.

In order to meet these standards, a new curriculum must accomplish a number of objectives. According to Wagner & Dintersmith (2016), it must first and foremost assist students in acquiring the new abilities required for the modern world. Education must provide students the creative, entrepreneurial, and global abilities they need to succeed in the era of smart technology and a globalized society, claims Zhao (2018). Instead of only offering "template" knowledge and facts, the curriculum should place more emphasis on helping students develop their skills. Focus must also be placed on the social and emotional health of the students. It must also ensure that children receive an education that is pertinent to both the global community and the environment. Equally important is the growing removal of subjects like physics and history from the curriculum for all students. The material is still essential even if competency-based education should include it.

According to Basham et al. (2018), the new curriculum should allow students to personalize it. According to Pane et al. (2015), computer-based programmes that attempt to adjust to students' requirements have been the most prevalent type of customized learning, even if the phrase "personalized learning" has been used occasionally in the literature. While positive results have been obtained using this method, Zhao (2018) argues that true customization can only occur when students are able to design their own unique learning routes. This allows students to follow their interests and skills. This calls for a flexible curriculum that gives students the freedom to choose the subjects they want to study and the flexibility to create their learning paths without being overly constrained by the curriculum.

### ***High School Education***

High Schools in Guyana and the Caribbean are quite similar since they sit the standardized examinations that are monitored by the Caribbean Examination Council (CXC) in Grade 11. Guyana would have inherited their system from the British and thus, the High

Schools share some similarities with them. In regard such as the system is a progressive one, where you need to pass one level to proceed to another. The students in Primary schools would write national examinations that determine which Secondary/High School they attend. At that school, they then go through a five-year programmes to sit the Caribbean Secondary Examination Certificate (CSEC) monitored by CXC, a regional body under the Caribbean Community (CARICOM).

This examination is necessary since without this students cannot gain entry into the country's Universities and other post-secondary or tertiary institutions. Additionally, it is a prerequisite to be employed in the country. Students are mandated to write at least five subjects at these examinations including Mathematics and English Language. The maximum number of subjects they can write in one sitting is thirty-three (33) subjects. For the past decade, Guyana has copped the top prize in this examination across the fifteen countries that sit the CSEC Examinations in the Caribbean. The students of High School are mandated to make thirty-nine weeks of attendance for the year where the programmes for these examinations is introduced in grade 9, even though High School starts in Grade 7. The first two years are preparatory years for the examinations.

## **2.5 Pandemic Impact**

Kuhfeld & Tarasawa (2020) found that families are facing additional challenges due to the shift from conventional in-person school attendance to online attendance. It is becoming evident that families depend on schools for more than simply literacy and mathematics. Children and adolescents, together with their parents or guardians, depend on schools to provide their needs for shelter, nourishment, medical treatment, and overall social welfare. According to Brummet (2014), the closure of a school is highly contentious and may significantly impact a large number of students attending surrounding schools. The academic

performance of children with special needs or learning difficulties may be affected since they often need personalized teaching and assistance from educators. Although technology may alleviate some of the effects of school closures, it cannot substitute the significance of in-person interaction between children and teachers. Further complicating matters is the fact that many students lack access to other technologies, making it more difficult to properly utilize instructional technology while schools are closed. However, the proactive school makes it clear that closing schools during pandemics is still one of the best ways to lessen the harmful effects of the disease. This is supported by both empirical data and the mathematical model of responsive educational institutions.

It delays the peak of the pandemic by one to two weeks and reduces the total number of diseases in the population by 25%, according to studies of past pandemics. 2019; Christakis & Christakis. Schools may be closed as a preventative or remedial action, claim Christakis & Christakis (2020). According to Christakis & Christakis (2020), schools are reactively closed when a student, staff member, or parent has been diagnosed with COVID-19. Proactive school closure occurs before the sickness is present in the building. Holcombe (2020) claims that the coronavirus-related school closures have led to new problems, such as how to move to online and at-home education and how to support students who rely on the school for their housing and food security.

According to UNESCO (2020), stopping schools because of the coronavirus might have the following detrimental effects:

1. Interrupted education: Students miss out on learning opportunities that are essential to their growth while schools are closed.
2. Nutrition: A lot of students rely on free or reduced school meals to receive food and a healthy diet. This is undermined by school closures linked to the coronavirus.

3. Equitable Access to Digital Learning Portals: Some students might not have dependable internet connectivity or access to technology while schools are closed.
4. Because parents frequently transfer their students to open schools, localized school closures place additional pressure on the educational institutions and systems that remain open.
- 5, Social Isolation: Since schools serve as centers for social connection and human engagement, closing them can deprive students and young people of social interactions and communications that are crucial to learning, growth, and creativity.

Technological integration in the classroom is crucial in the twenty-first century. The integration of technology in education has enabled educators to adopt a more flexible approach, taking on the roles of mentors, motivators, and facilitators. This contrasts with the traditional approach, where educators are seen as mere providers of information. As a result, students are now able to actively participate and acquire knowledge (Onyema & Deborah, 2019). Technology enables the possibility of virtual, remote, and distant learning. Education may take many different forms: blended learning, machine learning, ubiquitous learning, cooperative and collaborative learning, mobile learning, dispersed learning, and more.

Given the prevalence of digital education, it is essential that participants, including students, know how to transition to online learning. Utilizing relevant educational technology makes it easy to access learning materials such as Massive Open Online Courses (MOOCs) and various teaching modalities, which is necessary to satisfy the needs of a varied spectrum of students (Onyema et al., 2019). This corroborates the claim put out by Kirshner et al. (2010) that children who are already dealing with challenges related to urban poverty may encounter more strain due to the closure of schools. The indispensability of technology in education is recognized in the conclusion, especially during times of calamity. Onyema (2019) previously argued that due to the changing learning environment, the requirement for a flexible

methodology, and the importance of fostering innovation and creativity in the classroom, all educators must now incorporate emerging technologies into their teaching. This research would contribute to the expansion of our understanding of the impact of the coronavirus on the education sector and the need of using technology in the classroom.

### ***Technology Integration***

According to Mohamed & Lashire (2003), the usage of contemporary ICT alters traditional teaching methods and facilitates the integration of new courses and curriculum into already-existing applications. Increased computer and programmes use frequently helps accounting students save time, simplify the study process, and improve their learning. Additionally, according to Boyce (1999), it gives students the information and practical experience they need to develop certain abilities including writing, communication, interaction, critical thinking, collaborative thinking, and consciousness.

Marriott et al. (2004) looked at senior students' views regarding utilizing the Internet and how they used information and communication technology (ICT). Universities differ in how much their students utilize technology; male students are more computer literate and have better spreadsheet and analytical abilities than female students. Although many students expressed a preference for in-person training, they were also in favor of using the Internet as a teaching tool when it was used only as a supplemental resource.

Due to an increasing interest in using the Internet to better student-centered teaching and the desire for distant education, many higher education institutions included the virtual environment into their curricula to enable them to teach accounting to open and remote learning students. In this particular situation, one may contend that Kozma's (1991) assertion that students are driven to study is supported when learning is presented in fresh and imaginative ways. According to De Lange et al. (2003), this could also have an impact on

how much students "embrace" the internet as a teaching tool.

A study by Dowling et al. (2003) compared the effectiveness of traditional schooling with a hybrid teaching style. The survey was completed by students enrolled in accounting information systems programmes at two distinct universities. The hybrid technique integrated in-person teaching with other media, and the programme's effectiveness was measured by students' final exam results. Both female students outperformed male students, and total student performance was positively impacted by the paradigm being studied.

### ***Education during the Pandemic***

The wholesale closure of educational institutions and colleges was the most evident and immediate effect of COVID-19 on education. According to UNESCO (2020), nearly 1.5 billion students were impacted by nationwide closures during the pandemic's peak, which interfered with regular school operations and instruction. Teachers all over the world moved to online learning environments to lessen the effects of school closings and learning loss. According to Hodges et al. (2020), this shift created serious difficulties, particularly in places with poor access to technology, which made already-existing educational disparities worse.

Every industry was impacted by the global pandemic, and education was no exception the sudden closure of traditional classrooms and the transition to online instruction. Mechanisms for correcting learning loss had to be implemented to prevent more learning loss. This also led to several problems with the pandemic's consequences on schooling. This section of the literature looks at how the pandemic has affected schooling.

According to Chou et al. (2020), there may be a "digital divide" in schooling because of these discrepancies that disproportionately impact students from low-income families. A lot of the students were at a great disadvantage in access to equity in education since the availability of devices and more so active internet to use these devices were quite limited.

Schools in the city of Georgetown were not so affected, however, those in rural and indigenous communities of Guyana were greatly disenfranchised from education during the pandemic. Students from lower socioeconomic backgrounds frequently lacked access to necessary devices and dependable internet connections, exposing the digital divide (Bacher-Hicks et al., 2020). This discrepancy led to unequal educational opportunities. Several studies (Kuhfeld et al., 2020) have documented significant learning losses, mainly in reading and math, which hastens the differences between students from various socioeconomic backgrounds.

The pandemic forced educators to update and modify their teaching strategies and concepts. Hodges et al. (2020) found that online education became popular among educators worldwide. Kecojevic et al. (2020) claim that the stress and uncertainty brought on by COVID-19 has a detrimental effect on educators' and students' welfare, which may have an impact on their academic performance. Routine disturbances, uncertainty, and loneliness are the reasons behind students' higher stress, anxiety, and depressive symptoms (Xie et al., 2020). Due to their fear of not finishing the curriculum in time for the national and regional exams, students' mental health and wellbeing suffered throughout the pandemic due to unequal access to school.

Picciano (2020) reports a notable increase in the utilization of digital resources, video conferencing capabilities, and online learning platforms. The greater use of technology became paramount for the effective delivery of the curriculum to the students. Teachers, were forced to adapt measures that they were never exposed to in their career. This may have come easier for the younger teachers but for the ones that have been in the system for years, this was an ordeal. This difficulty they faced to adapt to technology was many times faced by the student and sometimes caused the lack of commitment by the students to the new methodology of learning. Without any prior training, most teachers had to adjust to teaching remotely. This

experience demonstrated the value of giving educators professional development opportunities to improve their digital literacy and online teaching techniques (Davis & Yoo, 2020). There was both pros and cons to this venture, since, some teachers were able to use the availability of online classes to upgrade themselves and some found it so challenging that they eventually took a career change. Teachers' job satisfaction and well-being were impacted by their increased workloads and the difficulty of adjusting to new teaching methods (Son et al., 2021).

Additionally, conventional methods of assessment were disrupted by the pandemic. Initially, all of the examinations in Guyana were done physically in classroom settings, no school was involved in online assessment, not even Google classrooms or Zoom. To manage within the conditions, assessment had to be introduced online and the quality control was quite limited. To support remote learning, Williams & Wong (2020) talked about how educators and institutions needed to reconsider their assessment strategies and move toward more adaptable and flexible evaluation techniques. Talks about the necessity of robust educational systems have been sparked by the pandemic. In their study, (Burns & Diamond, 2020) explored policy recommendations for strengthening teacher preparedness, expanding access to digital resources, and investing in infrastructure as ways to increase educational resilience in the face of upcoming crises.

According to Hodges et al. (2020), this change could have long-term effects on the way that education is provided, strengthening the role that online resources and blended learning play in the educational system. In reaction to the pandemic, governments and educational establishments have modified their policies to tackle the difficulties presented by COVID-19. IN Guyana, they modified national and regional assessments to ensure social distancing. One such amendment was the removal of paper 2 from the examinations and utilizing a research paper to supplement paper 1. According to Naser & Sha (2021), these policy changes could alter the nature of education and lead to more creativity and flexibility in teaching and

assessment techniques.

### ***Changing Role of Teachers***

The COVID-19 pandemic came out of nowhere and affected all levels of education. This in turn brought attention to educational disparities. It also forced everyone to be more accommodating by adopting digital solutions. To say the sudden switch from in-person to online learning was tough is an understatement, it was like trying to build a sandcastle in quicksand. Even though there are plenty of negatives, long-term effects might lead to improvements in the way education is delivered and regulated. Which includes a stronger reliance on technology and changes in laws to make it easier for when we face another crisis like this. Because of changes in how society demands information, tech advancements, and education paradigms, teachers have had to change their role dramatically as we entered the 21st century.

In this technological era, educators play the role of mentors for students as they independently explore and attain knowledge. Teachers provide structure and assistance to aid students in progressing from their current level of understanding to a higher one, as proposed by Vygotsky (1978). It is the responsibility of teachers to design engaging and relevant curricula that cater to the needs of twenty-first-century students. This includes incorporating technology and accommodating various learning styles and preferences (Koehler & Mishra, 2008).

Due to its increasing popularity, educators must properly integrate digital technology into the teaching and learning process. Mishra and Koehler (2006) suggest that teachers can employ technological pedagogical content knowledge (TPACK) to improve technology-enhanced education. In a rapidly evolving culture, teachers play a crucial role in assisting students in honing their critical thinking and problem-solving abilities (Pellegrino & Hilton,

2012). They encourage students to apply, integrate, and assess their knowledge in real-world contexts.

According to Eshet-Alkalai (2004), educators aid students in acquiring digital literacy abilities that enable them to navigate the extensive digital landscape, assess online content with a critical eye, and utilize technology proficiently. Educators oversee the evaluation of their students' progress and provide suggestions for improvement. As stated by Black & Wiliam (1998), both summative and formative assessments are vital tools for understanding student learning. Educators have a multifaceted role in the twenty-first century; their responsibilities extend beyond imparting conventional knowledge to encompass mentoring, integrating technology, promoting critical thinking, and fostering diversity and global consciousness. The preparation of students for the opportunities and challenges of the contemporary world relies on these evolving roles.

### ***Teaching Styles and Pedagogical Approaches***

Teaching styles are distinct from individual teaching methods, which refer to specific techniques (e.g., direct instruction, flipped classroom, problem-based learning). To establish clarity in analysis, this study categorizes teaching styles into three primary types:

1. ***Traditional Teacher-Centered Style***: Distinguished by low student involvement, lecture-based delivery, and direct teaching. This approach, which was popular in secondary schools in Guyana before the pandemic, is consistent with "chalk-and-talk" teaching strategies, in which the educator sets the learning pace.

2. ***Technology-Integrated Blended Learning***: This approach combines traditional and digital teaching methods, utilizing resources like Zoom, Google Classroom, and lectures that have already been recorded. During the pandemic, this approach became more popular as professors had to interact with students virtually.

3. *Student-centered interactive pedagogy*: This approach, which is frequently aided by digital platforms but may also be used in conventional classroom settings, places an emphasis on peer collaboration, inquiry-based learning, and active student participation.

The COVID-19 outbreak has sparked a remarkable transformation in instructional techniques and educational practices in the secondary schools of Guyana, just as it has in numerous other regions across the globe. Historically, Guyana's educational system has been characterized by a teacher-centric, lecture-oriented methodology. However, the pandemic has compelled a shift towards blended learning, online instruction, and student-focused approaches. In this article, we delve into the changes that have taken place in traditional teaching methods and pedagogical approaches in Guyana's secondary schools amidst the pandemic. Previously, secondary schools in Guyana relied heavily on a teacher-centric approach, where educators held the primary responsibility of imparting knowledge through lectures (Dunham, 1991). This method often lacked opportunities for student interaction or active participation from students. Despite the challenges of the pandemic, it has caused the evolution of a pupil-centered curriculum for the students of Guyana. Additionally, when you look at schools in the interior regions and the coastline, it allows teachers to practice a differentiated method of teaching that suits the needs of most of the cultural differences among Guyanese students.

There was a significant amount of memorization, with an emphasis on acquiring knowledge and information for assessments (Bisnauth, 2018). This approach may not foster as much ingenuity or analytical thinking. As per UNICEF (2018), the secondary schools in Guyana primarily adhered to a standardized national syllabus that lacked flexibility and the ability to cater to the diverse learning needs of the students. The initial transformation brought about by the pandemic was the swift transition to remote learning, prompted by the outbreak of COVID-19. This necessitated the utilization of technology to engage students and

deliver educational content (World Bank, 2020). One such example was the use of AutoCad to teach Technical Drawing in High Schools in Guyana, all other countries in CARICOM introduced this method in 2016, except Guyana. With the pandemic, Guyana was forced to accommodate this method since it was the only way now to complete the syllabus for the examinations. The students found this to be easier, and there was a significant increase in the number of students writing this subject.

In order to address the diverse requirements of their students, secondary schools in Guyana have started employing blended learning, which combines traditional and digital instruction (Khemraj et al., 2021). This method encourages more adaptability throughout the learning process. Since the pandemic and the start of classes in 2022, schools have used the integrated learning approach. As pandemic outbreaks have shown, a well-rounded education is essential, and all children, especially those with impairments and limited access to technology, must be able to fully engage in blended and online learning (UNICEF, 2020).

According to Khemraj et al. (2021), the global health crisis has made it more important than ever for educators to receive professional development and training in integrating technology and online learning. In response to the emerging teaching methods, a considerable number of teachers in Guyana underwent training. These educators ventured into diverse evaluation techniques, transitioning from conventional exams to a broader spectrum of assessments, such as project assignments and online tests (Bisnauth, 2020). Guyana's secondary schools acknowledged the diverse cultural and regional requirements of their students and commenced adapting their curricula to better align with local contexts (UNICEF, 2020). This adjustment had not been undertaken prior to the pandemic, and although the pandemic was not directly linked to the cultural insufficiency in the curriculum, its presence led to a transformation of the curriculum's content, recognizing the necessity for further development for future generations.

Guyana's high schools saw a significant change in pedagogical approaches and teaching styles because of the COVID-19 pandemic, moving toward more adaptable, student-centered, and technologically integrated approaches. The acknowledgment of the value of flexibility and inclusivity in contemporary education is reflected in these modifications.

### ***Technology Integration***

In Guyana, especially in secondary schools, the use of technology in the classroom has increased dramatically. This is especially valid when it comes to adapting to remote or hybrid learning environments. This accelerated the use of technology in the classroom by forcing educators to use a variety of online learning tools and platforms to decrease learning loss. Smart rooms have started to enhance the integration of technology into the educational process in many institutions.



*Image of smart classrooms at Brickdam Secondary School, Georgetown. (Source Ministry of Education)*

Online learning environments like Moodle and Google Classroom are being used by

Guyana's high schools more and more to offer curricula and assignments (UNICEF, 2020). Teachers and students can interact, arrange resources, and turn in assignments more easily with the help of these platforms.

A more engaging educational experience results from teachers and students interacting in real-time (Khemraj et al., 2021). Students' performance has been greatly impacted by the usage of technology in some academic areas. One in particular is Caribbean History, this subject was always deemed to be a lecture subject and teachers would stand and just lecture a myriad of information to the students, sometimes past saturation point. According to the Ministry of Education website, in 2019, pre pandemic Caribbean History garnered a 68.1% and then in 2020 amidst the pandemic when both the students and teachers were at a lost it secured a 64.49% pass rate. With a more blended approach and the utilization of technology in showing students the maroon societies in the Caribbean, the impact of the US in the Caribbean with videos and documentaries. They were able to have exchange lecturers via Zoom with specialist across the Caribbean in the subject area. These along with more concise lessons, summarized points and demonstrations saw an improvement of 70.73% pass rate in 2021. The utilization in technology not only affected the pass rate but saw more students opting to write the subject at CSEC.

The majority of high school students in Guyana now have easy access to a variety of educational resources because of technological improvements. According to UNICEF (2020), these resources include educational websites, video lectures, and electronic books. As a result, this has made it easier for students to transition to independent learning and given them access to a wide range of educational resources. According to the World Bank (2020), mobile learning—the use of mobile devices for educational purposes—has become more popular, particularly in rural regions where access to traditional desktop computers is restricted. Students rely heavily on smartphones to access educational resources and participate in online

courses, making learning more accessible and flexible. Moreover, high schools in Guyana have adopted digital assessments, such as online tests and quizzes, to evaluate student progress, as highlighted by Bisnauth (2020). Technology has made it possible to conduct these evaluations efficiently and securely, ensuring a comprehensive assessment of students' knowledge and skills.

Digital assessments and mobile learning have drastically changed the educational process by enabling students to access resources easily and demonstrate their mastery. The use of technology in education has made it necessary to offer professional development opportunities and teacher training in order to improve educators' digital competency and instructional technology skills (Khemraj et al., 2021). There are a lot of seminars and courses available to help teachers adjust to this new way of thinking. Some high schools have used hybrid learning approaches, which combine online and in-person education, to meet the varied learning requirements of their students (UNICEF, 2020). This approach takes into consideration the challenges posed by the ongoing pandemic.

For Guyana's disabled children, inclusive education has been made possible in large part by technology. Everyone's access to education has improved with the use of assistive technology, such as screen readers and speech-to-text tools (UNICEF, 2020). Although technology is essential in helping Guyana's secondary schools adjust to blended or remote learning environments, some obstacles have surfaced. In order to ensure that every student has fair access to high-quality education, issues including the dearth of digital devices for every student, the inadequate internet connectivity in rural regions, and the need for infrastructure development must still be addressed. These can be reduced for students by providing the Ministry of Education with more funds for the development and acquisition of these resources. The Ministry of Education in Guyana needed to look at equity and less equality. For instance, the schools in the city are not given the same resources as the schools in the interior. This is

unfair since the city schools are additionally funded by the private sectors and kind donors. The location of the interior schools, such as those near the border of Brazil, is not privileged with the same kindness. Furthermore, resources have to be allocated based on need. While some schools may require devices regardless of their location, others would require both gadgets and reliable internet access. To guarantee that educational resources are used properly and that all students are in the same "field" when it comes to the learning process, the Ministry of Education has to put in place a more rigorous means of monitoring schools outside of large cities.

(<https://www.facebook.com/100067916143278/posts/pfbid0vF42AHuxtMdFr7mgPPbApZkEujQMmuafkk4oAvuxCKMPbjHexMLAexU9PVryA3Jrl/?mibextid=2JQ9oc>).

These issues are not just arising, they have been prevalent for years, with the pandemic technology had to be used. Now that schools have resumed some sort of normalcy it does not mean that technology should be thrown in the corner but rather blended to improve the learning since the students are already au-fait with it. The map below shows the location of the communities in Guyana and that geography has contributed to several schools and students being disenfranchised from resources and this significantly affects them in equity.

**Figure 3**

*Figure 3: Map of Guyana Depicting Communities and Administrative Regions*



*(Source Detailed Political Map of Guyana - Ezilon Maps)*

## 2.6 Teacher Preparedness and Next Steps

To enhance their ability to adapt to changing educational methods and effectively utilize technology in the classroom, teachers in Guyana need to engage in professional development and training initiatives. These programmes play a vital role in keeping teachers updated on the latest teaching techniques and most effective methods. Although the specific programmes may evolve in the future, there are plentiful opportunities for Guyanese teachers to continue their professional growth. Unfortunately, when compared to other countries, there may be a lack of easily accessible public information regarding these programmes. However, the following broad approaches and resources can be explored:

### ***Ministry of Education Initiatives***

The Ministry of Education in collaboration with the National Centre for Education Resources Development (NCERD) have implemented several training programmes to aid in the development of teachers in the system. The website of the Ministry would have access to resources needed by teachers as well for usage in the classroom, [Ministry of Education, Guyana](#). The Ministry in collaboration with NCERD have done technology training, and modification of curriculum to be more consolidated to suit the needs of the post-pandemic.

### ***Teacher Training Colleges***

Established in 1928, the Cyril Potter College of Education was established to train the teachers of Guyana, in 2010 the College added the Associate Degree in Education programmes for Early Childhood, Primary and Secondary teachers ([CPCE | Cyril Potter College of Education](#)). These programmes focused on developing the pedagogical abilities of teachers to better aid the teachers. With the pandemic, the College introduced technology as part of the course outline for the teachers.

### ***Webinars and Online Courses***

To build the teachers' capabilities, the Ministry of Education offered free courses from Coursera. Also, in collaboration with the Ministry of Public Services started to offer bachelor's, postgraduate diplomas and master's programmes for the development of public servants. In 2022, they added doctoral studies to the list of programmes.

### ***Non-Governmental Organizations (NGOs)***

NGOs that support education may provide courses for aspiring teachers. Organizations that have dedicated time and resources to improving teachers' abilities to better support students in the classroom include UNICEF and USAID. These courses take place all over the world, and professors receive compensation for their travel expenses because some of the locations are extremely far away.

### ***In-Service Training Workshops***

The Ministry of Education has involved in several workshops in schools, to better aid teachers. In this regard, specialists are sent to schools at varying times to incorporate the needed skills for teachers. Some of these workshops are even done by CXC to better build the skills of teachers in particular subject areas.

### ***Student Engagement and Learning Outcomes***

Students' levels of interest, engagement, and academic achievement are significantly impacted by the various educational philosophies. Due to the COVID-19 pandemic, which required modifications to teaching strategies for remote and hybrid learning environments, the current discussion has a unique background. In this discussion, we would thoroughly explore research findings concerning the effects of various teaching philosophies, particularly

with regard to the pandemic. Supporting our arguments with relevant references, we would delve into the topic of student motivation and engagement, highlighting the limitations of traditional lecture-style instruction that predominantly focuses on teacher-centred methods. According to research by Majid et al. (2014), lecture-based instruction frequently results in reduced involvement and engagement of students. However, studies have shown that students who engage in cooperative projects, group discussions, and problem-based learning are more motivated and engaged when they use active learning strategies. This underscores the significance of incorporating active learning into student-centered teaching. Additional studies, including research conducted by Prince in 2004, have further demonstrated that active learning techniques not only enhance academic achievement but also contribute to better retention of information.

Active learning in the classroom fosters and builds more hands-on learning by students. It was observed in teacher X class, where he was teaching 'Twelfth Night' in Literature. Instead of having the students just read the play and then explain their interpretation. He had them do the play in a dialogue form and discuss their interpretation of the play. To further solidify their understanding of the play. He tasked each group with a scene from the play and asked them to adapt it to a Guyanese setting, using the context but replacing it with a Guyanese language and interpretation. They dressed in the role they took on and even had a male playing a female and a female taking on a male's role. This method further allowed the children to grasp the concept without the language of Shakespeare's play being a barrier.

Students' participation has been found to be positively impacted by the mix of in-person and online training. More independent study and engagement with the course materials are made possible by these methods (Chen & Wang, 2018). The adaptability of these models proves to be especially beneficial during times of a widespread illness. Studies have revealed that incorporating technology in the classroom, such as virtual laboratories, online

simulations, and educational applications, enhances student drive and involvement (Kay, 2012). The pandemic accelerated the adoption of technology in education, further highlighting its advantages (Biswas et al., 2014). Research indicates a link between increased student engagement and performance and inclusive teaching approaches that cater to various learning styles, needs, and abilities. In the face of a pandemic, these strategies are vital to tackling the specific challenges that students may encounter (Hockings, 2010). There are challenges to incorporating technology as many students do not have access to the needed devices and reliable internet services. Additionally, the teachers are not versed in technology and thus, are unable to monitor and guide the students in a manner that would ensure productivity in the classroom rather than a distraction.

The usage of Universal Design for Learning (UDL) would encourage a full pupil-centered curriculum since this would cater for students of different abilities and disabilities. It allows differentiated instructions for the same content as it targets the plethora of students that are present in all societies including Guyana. The utilization of these educational approaches nurtures the development of critical reasoning and problem-solving capabilities. As indicated by the investigation conducted by Barron & Darling-Hammond (2008), these approaches amplify the performance and active participation of students. The achievement in academics and the enthusiasm of students have been proven to reap rewards from tailored instruction, which revolves around addressing the individual requirements and interests of each student (Pane et al., 2015). Particularly, personalized learning on digital platforms has demonstrated remarkable advantages. In light of the pandemic, the adaptability of teaching methods has become imperative. Through versatile strategies such as blended learning and the integration of technology, educators can sustain the motivation and engagement of their students, even within remote or hybrid learning environments. It is noteworthy to acknowledge that diverse teaching philosophies exhibit distinct efficacies depending on the subject matter, grade level,

and unique characteristics of each student. In the educational landscape after the pandemic, a blend of teaching methods may prove to be the most effective approach to meeting the varied needs of students.

### ***Challenges and Barriers***

Similar to many other areas, the Caribbean encountered numerous challenges and barriers in transitioning to digital education for both teachers and students. These obstacles were especially evident in the Caribbean due to factors such as disparities in socioeconomic status, differing levels of proficiency in using digital tools, and limited availability of technology and internet access.

### ***Limited Internet Access and Infrastructure***

Due to the Caribbean region's abundance of isolated and rural areas, it is frequently difficult for teachers and students to access online resources due to a lack of a strong internet infrastructure. In many cases in Guyana, internet access is quite limited, the terrain of the high mountains in interior regions has prevented the accessibility of modern technology to reach those places. Although Guyana is an oil-producing country our economy is still developing, and with a high poverty rate, the challenges would continue to exist. At present several companies offer internet, however, the efficiency of the service is another issue. Additionally, many of these companies offer to only urban and rural communities along the coastline of Guyana. This challenges the remaining population to have equal access to the internet.

### ***Lack of Access to Digital Devices***

One of the main obstacles to online learning was the abundance of Caribbean teachers and there was no access to personal laptops or other technology for the students. Since many

students lack access to suitable gadgets and high-speed internet, the digital divide is a significant issue. Some students encountered difficulties participating in virtual classrooms because of the disparities in their access to technology and the internet. Not every student, educator, or parent understands how to use digital platforms and tools for learning. Several educators had to swiftly adapt to the world of online learning, and some parents and children found it challenging to operate the technology. In addition to that, access to devices is a great challenge, many homes can barely afford one device, so the homes that have more than one child that needs to have devices were at a great disadvantage.

### ***Socio-Economic Disparities***

The digital divide may be exacerbated in the Caribbean by socio-economic differences that make it difficult for students to afford digital devices and internet access. The shift to online learning brought to light disparities in funding and resources between school districts. Certain districts possessed superior financial and technological means to assist their educators and students compared to others. The high cost of living, with socio-economic issues such as crime, poverty, and low income all contribute to the effective use of technology for both teachers and students. Most homes in Guyana are low and middle income so their priorities are mainly focused on food, clothing and shelter. Amenities such as devices, the internet and the use of technology generally is secondary to their needs.

### ***Teacher Training***

Many Caribbean educators, without sufficient experience in online teaching methods, were forced to swiftly adapt to digital platforms without adequate assistance or resources. Many educators were taken aback by how quickly they had to switch to online instruction. For them to receive training in online teaching approaches and technology, time and

resources were needed. The Ministry of Education to garner political leverage had expanded the intake of teachers into the college, however, the question of quality over quantity now prevails ([Almost 5,000 people register for training at teachers' College – News Room Guyana](#)). The ability to train these teachers with the lack of human resources at the College is a herculean task.

### ***Content and Language Barriers***

Students may experience comprehension problems and language barriers as a result of the unavailability of online educational resources in their native tongue. Guyana is officially an English-speaking country, however, most of the citizens speak Creolese (broken English). In addition to the many Amerindian communities where the students speak their indigenous dialect. With the influx of Venezuelans and other migrants that have free access to education in the schools is not becoming problematic for teachers, since programmes have to be made multilingual for students, which the teachers themselves are unable to facilitate.

### ***Unequal Curriculum Adaptation***

Modifying traditional curricula into an online format can pose challenges, and certain institutions may encounter difficulties in adapting their curricula to suit online instruction. It was difficult to translate traditional curricula into an online format, and many teachers had difficulties in making sure that learning objectives were met.

### ***Student Engagement and Motivation***

It might be difficult to keep students motivated and involved in an online setting because they could feel alienated and detached from the virtual learning environment. It might be challenging to maintain students' active participation in an online environment.

Diverse disruptions may arise in the household, and the lack of in-person connections with classmates and teachers might potentially deplete their motivation.

### ***Assessment and Evaluation***

Caribbean educational institutions may encounter challenges in establishing fair and effective protocols for assessing and grading students in an online setting. The task of developing equitable and efficient methods to evaluate and appraise students in a virtual environment presented considerable difficulties. Some educators were compelled to adapt their assessment practices to accommodate remote learning.

### ***Digital Literacy***

There were various levels of digital proficiency among many educators and students, thus it became crucial to offer aid and guidance to those less familiar with technology. The unique challenges were encountered by students with disabilities due to the complexities involved in delivering specific online special education services. Meeting the personalized requirements outlined in individualized education plans (IEPs) often proved arduous in a remote setting.

### ***Support and Involvement from Parents***

Particularly for younger students, parental involvement is crucial when it comes to their online education. However, some parents are not equipped with the fundamental skills required to offer the required assistance and direction. Despite differences in parental skills, parental participation in their children's education grew over the remote learning period. Some parents were more prepared to help their students with their online education than others.

### ***Problems with Power and Electricity***

Regular power outages can cause problems in some Caribbean areas, disrupting online classes and causing more issues. On average many places experience power outages at least twice per day, however, in far-flung areas, there is no electricity provided entirely. The only provider of electricity in Guyana is the Guyana Power and Light (GPL) Inc. This singularity is very disadvantageous since when they don't operate properly the option does not exist for a choice. The use of renewable energy is now being practised by many, however, this is quite expensive for many households. To alleviate this, the government needs to either privatize the company or seek alternative companies to provide electricity.

### ***Privacy and Security Issues***

When offering online courses, educational institutions had to deal with privacy and security issues, which included safeguarding student information and avoiding interruptions by unauthorized individuals. Since there is no authentic way of monitoring students' actions online, it has opened the doors to a new form of privacy issues. Many students within the period have experienced cyberbullying and have been victims of hacks. Additionally, the presence of AI and several apps that significantly assist students in assignments affects the evaluation process, particularly for formative assessments. Most schools do not have software that checks the assignments submitted to determine their 'humanness' and authenticity.

### ***Technology Infrastructure***

Certain regions and educational institutions encountered technical difficulties and interruptions due to the inadequate infrastructure required to meet the increasing need for virtual education. These challenges emphasize the necessity for a comprehensive and fair

approach to online learning, which tackles the digital gap, provides educators with professional growth opportunities, and ensures that families and students possess the necessary tools and resources to succeed in an online learning setting. The Ministry of Education has established several smart rooms in schools in developed areas in Guyana to allow the effective use of online learning in the classroom. However, these smart rooms do not accommodate a large amount of students, for example the one at Queen's College can accommodate 30 students maximum and the College's enrolment is 963 (as of October 2024).

The global health crisis compelled educational establishments and policymakers to confront these issues and allocate funds towards the creation of inclusive and resilient educational initiatives. As part of their local content policies, Exxon Mobil has invested in the improvement of online learning in several schools in Guyana. They have provided training for teachers in this area and provided several students with devices and internet access.

### ***Government Policies and Support***

Governments, educational institutions, and communities in the Caribbean must collaborate to improve digital infrastructure, give teachers and students training and support, and make sure that everyone has access to online education, regardless of where they live or how much money they make. Investments in digital literacy initiatives and technology can also aid in reducing these difficulties and improving the effectiveness and accessibility of online learning.

Online learning resources for educators and students were created by the Guyana Ministry of Education in partnership with the Guyana Learning Channel. To facilitate remote learning, these resources included printable materials and video lessons. To assist educators in adjusting to online teaching techniques, the government launched several training initiatives, including webinars. The purpose of these training sessions was to improve the pedagogical

abilities and digital literacy of teachers for online instruction.

To address the issue of limited access to technology, the government worked on providing digital devices to teachers and students alike. There were laptops, tablets, and other gadgets available to help with online instruction. An attempt was made to increase internet connectivity in isolated locations with poor access. This included encouraging educators to sign up for inexpensive internet plans and giving schools access to the internet.

To consider the new teaching and learning environment, the Ministry of Education modified the curriculum and assessment procedures. Making learning objectives more attainable in an online environment was the goal of these modifications. During the pandemic, the government was aware of the difficulties teachers were having with their mental health. Counseling services and support networks were established to attend to educators' psychological health.

### ***Emerging Best Practices***

To keep teachers informed about updates, policies, and best practices pertaining to online education, the government and the Ministry of Education regularly communicated with them through a variety of channels. To gain access to more resources and knowledge in the areas of educational technology and distance learning tactics, the government worked with NGOs and international agencies. It's crucial to remember that the COVID-19 pandemic response, including educational programmes, can differ by location and may have undergone updates and revisions over time.

### ***Digital Literacy and Training***

Teachers and students should receive priority instruction in digital literacy in high schools. Effective online learning requires offering resources and training to enhance

technological proficiency (Bates, 2019). Investments can be made to ensure devices are available for students even if it is only in the classroom alone.

### ***Equitable Access to Devices and the Internet***

It is essential to make sure that every student has access to appropriate devices and a dependable internet connection. To guarantee connectivity, some high schools may think about working with neighborhood internet providers and giving devices to students in need (UNESCO, 2020).

### ***Engaging and Interactive Online Learning Platforms***

Using these kinds of platforms can improve student motivation and participation. Platforms that facilitate interactive tests, video conferences, and group projects can be investigated by high schools (Means et al., 2014).

### ***Teacher Professional Development***

To ensure that online instruction is effective, teachers must receive ongoing training. Regular professional development opportunities, such as workshops and online courses, can be provided by high schools (Hodges et al., 2020).

### ***Clear Channels of Communication and Support***

High schools ought to keep open lines of communication with teachers, parents, and students. The online learning experience can be improved by offering assistance and direction to educators as well as students (Inan & Lowther, 2010).

### ***Flexible Scheduling***

One way to lower barriers to online learning is to provide students with flexible schedules that can be adjusted to suit their needs and preferences. Both synchronous and asynchronous learning options are available in high schools (Means et al., 2014).

### ***Inclusive Assessment Procedures***

High schools can create inclusive procedures that consider the difficulties associated with online learning. A combination of projects, assignments, and online tests may be part of this (Brookhart, 2013).

### ***Peer Collaboration and Social Interaction***

Promoting social interaction and peer collaboration among students can aid in the fight against the isolation that arises in online learning environments. Group projects and conversations can be facilitated by high schools (Means et al., 2014). The greatest asset of any country is its people and thus it is paramount that these collaborations be fostered for the betterment of the nation at large. As technology were come an integral part of the future and therefore the students should be trained assiduously in this area.

### ***High-quality Resources and Content***

High schools should guarantee that the online educational resources they use are in line with curriculum standards and of the highest caliber. Student success depends on having access to a variety of educational resources (Bates, 2019).

### ***Data Monitoring and Feedback***

High schools can track students' progress and give timely feedback by utilizing data

analytics. To provide targeted support and identify struggling students, this can be helpful (Hodges et al., 2020). It is important to gather feedback as this would ensure the effectiveness of the programmes and to what extent changes need to be made to ensure the most is achieved. Innovative or high-performing schools can set an example for other educational institutions across the nation and offer important insights into successful online learning tactics.

### ***2.7 Gaps in the Literature***

Researchers and policymakers can have a more thorough grasp of the pandemic's effects on education by identifying gaps in the material. Few longitudinal studies evaluated the long-term academic and socioemotional repercussions for pupils, whereas several studies looked at the short-term implications of COVID-19 on Guyana's educational system. More longitudinal studies were needed to assess long-term learning benefits or losses, even though the study showed rapid learning disturbances (Azevedo et al., 2020). Furthermore, additional research was required to determine the best ways to address current racial and socioeconomic gaps in schooling (Reardon, 2020).

Students with impairments were disproportionately impacted by the pandemic, underscoring obstacles to inclusive education in Guyana. To completely comprehend these issues and provide viable solutions to guarantee fair learning chances, further study was required. Educators were also greatly affected, feeling more anxious and stressed. The effectiveness of professional development initiatives put in place in reaction to the crisis and the long-term impacts on teachers' well-being might be investigated through longitudinal research. The long-term effects of the pandemic on the mental health and well-being of pupils, parents, and support systems also need investigation (Racine et al., 2020).

During remote education, parental engagement and support were found to be crucial

components of children's learning. The opportunities and difficulties parents had while assisting distance learning in the Guyanese environment needed to be further explored. Additionally, more research was necessary to determine if Guyana's digital infrastructure was adequate, taking into account differences in device availability and internet access. Research was required to determine how effectively online learning resources matched the national curriculum and to gauge the success of programmes meant to increase digital access (Means et al., 2014).

There is very little research on educational equity in Guyana. Given the differences in opportunities, learning outcomes, and access, special attention was required for underserved or vulnerable groups. Studies on efficient evaluation procedures in remote and hybrid learning settings were similarly lacking (Nicol & Macfarlane-Dick, 2006). Assessing the effectiveness of professional development programmes and teachers' preparedness for abrupt online education remained critical (Hodges et al., 2020). Even though the digital divide has been extensively studied, further research was necessary to determine workable solutions (Chen & Lerman, 2020).

Another area that received less attention was the contribution that community involvement made to education throughout the pandemic. In order to mitigate educational disruptions, research was required to determine the best ways to include parents, local governments, non-governmental organizations, and the commercial sector (Epstein et al., 2019; Penuel et al., 2017). Lastly, no comparative study has been done on the effectiveness of the policies and procedures put in place during the pandemic, such as changes to the curriculum, methods for evaluation, and safety and health precautions. Regional and cross-national research might yield important information on lessons learned and best practices in various educational settings (UNESCO, 2020).

The literature study brought to light the intricate and varied effects of the COVID-19

pandemic on schooling, especially in the Guyanese setting. With an emphasis on active participation, teamwork, scaffolding, and the use of technology to facilitate meaningful learning, constructivist and connectivist frameworks demonstrated how educational approaches changed throughout times of distant and hybrid learning. Understanding how educators modified their duties to deal with the difficulties of online learning, build resilience, and advance a cooperative and encouraging school climate was made possible by transformational leadership.

Notwithstanding these revelations, the literature also identified important gaps. Few longitudinal studies were looking at the long-term psychological, socioemotional, and academic impacts on parents, teachers, and students. Particularly in the Guyanese context, there is still a dearth of research on teacher preparedness, digital infrastructure, equity, accessibility, and the efficacy of professional development programmes. These limitations emphasized the necessity for research that examines the long-term effects of pandemic-induced pedagogical changes on student performance and engagement, in addition to their durability.

The current study used an explanatory sequential mixed-method approach to examine how teachers' responsibilities and instructional tactics changed during and after the pandemic in Guyana's secondary schools, building on these theoretical underpinnings and the gaps that were uncovered. The study sought to investigate the degree of adherence to innovative leadership and instructional approaches, the integration of digital resources, and the resulting impacts on student performance, specifically with reference to CSEC results. The study positioned itself to produce both conceptual and empirical insights into the post-pandemic educational landscape by connecting the theoretical frameworks to the research design. This addressed the need for evidence-based strategies that assist educators, students, and larger school communities in navigating current and upcoming educational challenges.

## **2.8 Summary**

Education is among the sectors most negatively affected by the unprecedented breakdown of global infrastructure caused by the COVID-19 pandemic. This essay examines the ways in which the pandemic has altered Guyana's educational system and argues that it has exposed both areas that require major reform and those that already have problems. Using an in-depth examination of the alterations resulting from the pandemic, the article highlights the necessity of a drastic reconsideration of educational methodologies and regulations in Guyana.

It is crucial to take into account both the historical development of Guyana's educational system and the theoretical frameworks that direct educational research in order to comprehend the pandemic's consequences on the nation's educational system. Particularly pertinent are constructivist learning theories, which highlight the need for active, student-centered learning. According to these beliefs, learning should take place in a way that allows students to gain new information through relevant experiences. These ideas have to be reevaluated because of the pandemic's transition to online learning, which replaced conventional classroom dynamics with digital connections.

In a similar vein, frameworks for technology integration in education shed light on the most efficient ways to apply technology to improve teaching and learning. These frameworks emphasize how crucial it is to match technology with educational objectives in order to guarantee that the latter are enhanced and supported by the former. The pandemic in Guyana has brought attention to the urgent need to update educational procedures and facilities, exposing the advantages and disadvantages of the current setup.

Guyana's educational system has changed throughout the years, mirroring wider shifts in the country's sociopolitical and economic landscape. After being initially shaped by colonial educational methods, the system has progressively included more modern techniques.

Nevertheless, infrastructure limitations and limited resources have frequently impeded this shift. The COVID-19 pandemic has made change more urgently necessary by highlighting the flaws in the current system and emphasizing the need for a more flexible and cutting-edge approach to education. During the pandemic, the abrupt switch to online learning revealed a number of significant issues with Guyana's educational system. Schools were compelled to swiftly switch from traditional classroom instruction to virtual learning settings, exposing significant disparities in technological support and accessibility.

One of the most urgent problems was the unequal distribution of technological access. Due to limited digital infrastructure, many schools and students in Guyana had severe constraints, such as inconsistent internet access and a dearth of digital gadgets. The digital gap made already-existing educational disparities worse, especially for low-income students who found it difficult to participate in online courses. A major obstacle to successful schooling during the pandemic was the inability to get necessary technology resources.

The pandemic also revealed flaws in the architecture of schooling. Without the required technological assistance or training, the quick transition to online schooling took place. Several educators were ill-prepared to adjust to new digital tools and platforms, which made it more difficult for them to provide quality education. The successful introduction of online learning was hampered by the lack of a strong digital infrastructure and resources, which made learning more difficult for both teachers and students.

Additionally, there was a noticeable difference in learning outcomes and student engagement after the switch to online instruction. It was difficult to keep students motivated and engaged when there were no in-person contacts. Students' experiences with online learning varied greatly, and those who did not have supportive parents or a home setting were more likely to struggle. The pandemic brought attention to the need for inclusive, adaptable teaching methods that can meet a range of student demands.

The pandemic required a fundamental shift in the duties and approaches of educators. Teachers had to swiftly adjust to new educational techniques and technologies, which led to several major changes. To support online learning, teachers have to become adept at a variety of digital technologies and platforms. This required not just learning new technology but also rethinking teaching strategies and materials to work in the virtual setting. The sudden move caused a great deal of stress for teachers, many of whom had never taught online before. Given how quickly things changed, it became evident that teachers needed targeted professional development to assist them adjust to the new learning environment.

Apart from adjusting to new technology, the pandemic forced educators to reconsider their teaching strategies. It was necessary to adapt conventional teaching strategies, such as direct instruction and in-person encounters, to the online environment. Teachers in a virtual environment have to come up with new ways to measure learning objectives, engage students, and deliver knowledge.

Pedagogical techniques needed to be redefined in order to preserve educational continuity during the pandemic. The difficulties that come with teaching remotely made it clear that teachers needed continual professional development. Enhancing teachers' digital literacy, pedagogical abilities, and capacity to adjust to rapidly changing educational technology requires effective professional development programmes. Ensuring the success of online learning programmes requires providing educators with the support and tools they need. Using digital platforms, multimedia tools, and continual professional development for teachers are some of the essential elements of integrating technology into education. Guyana may benefit much from studying the best practices of other nations that have effectively integrated technology into their educational systems.

The careful selection of digital tools and platforms that complement educational objectives is necessary for the successful integration of technology. The degree to which these

tools can accommodate different learning demands and remain easily navigable and accessible determines how effective they are. Guyana may learn a lot from the extensive support systems that emerged in advanced digital infrastructure countries for teachers and students.

Enhancing online learning experiences requires the integration of multimedia materials, including interactive simulations, digital textbooks, and films. By catering to a variety of learning needs and preferences, these tools can enhance the learning process and make it more participatory. Examining the best ways to incorporate multimedia materials into the curriculum might enhance students' educational experiences.

Sustained professional growth is necessary for the effective incorporation of technology. Teachers require continual professional development and assistance in order to employ digital technologies and modify their teaching strategies. The main goal of professional development programmes should be to improve the pedagogical and digital literacy of teachers so that they can effectively handle the difficulties associated with online learning.

The community, parents, teachers, and the government must all actively participate in any change of Guyana's educational system to be effective. To provide a welcoming and inclusive learning environment, cooperation is crucial. When it comes to providing the infrastructure and resources required for education, the government is essential. This entails making investments in technology infrastructure, guaranteeing fair access to digital resources, and assisting with educators' professional development. Prioritizing education as a crucial area for change and investment is imperative for policymakers in order to solve the issues brought to light by the pandemic.

The effectiveness of educational change is largely dependent on educators. Their wisdom and experiences have been essential in establishing laws and procedures that deal with the difficulties associated with technology integration and online education. Teachers ought to be given chances for professional development and active participation in decision-making

processes. Involving parents and the community is also essential to fostering a positive learning environment. Working together with these stakeholders can solve equity and access-related challenges and provide teachers and students more assistance. Participation in the community promotes a more inclusive educational approach and increases the sense of shared accountability for academic results.

The pandemic has presented obstacles, but Guyana's educational system still has a lot of room for innovation and advancement. The crisis has spurred technological adoption and brought attention to the need for more adaptable and durable teaching methods. Seizing these changes can result in an education system that is more resilient and flexible. Teachers are investigating novel pedagogical ideas and techniques, such individualized education and blended learning models, as a result of the pandemic. These developments have the potential to improve learning outcomes and better serve the requirements of a diverse student body. Through the incorporation of new approaches into the curriculum, Guyana may enhance academic results and prepare for future obstacles.

Infrastructure investments in technology have become crucial. Improving internet connection, technical assistance, and digital tools may help close the digital divide and guarantee that every student has access to high-quality instruction. Reducing educational disparities and promoting efficient online learning depend on addressing these infrastructural requirements. A more welcoming and encouraging learning atmosphere may be established through cooperative education reform. Stakeholders may address issues, put best practices into action, and influence significant changes to Guyana's educational system by banding together. Taking advantage of the chances for innovation and progress brought about by the pandemic can result in an education system that is stronger and more robust.

The COVID-19 pandemic has shown both potential and barriers to transformation in Guyana's educational system, resulting in a deep and diverse impact. Significant differences in

access to technology were made clear by the quick shift to online learning, underscoring the need for a more flexible and technologically advanced approach to education. This chapter has provided a thorough examination of the pandemic's effects on education in Guyana by examining theoretical frameworks, historical context, and best practices from other nations. It promotes a fundamental reevaluation of educational methods and highlights the value of stakeholder cooperation in advancing systemic change.

Adopting a coordinated strategy including all stakeholders is vital to guaranteeing that the pandemic leads to beneficial and enduring improvements. Through the implementation of creative methods and the utilization of the possibilities provided by the pandemic, Guyana may establish an education system that would not only weather the current crisis but also emerge stronger, more robust, and better suited to fulfill the demands of coming generations.

### CHAPTER 3: RESEARCH METHODS

The COVID-19 pandemic changed educational systems, necessitating an instant switch from traditional in-person instruction to online learning environments. This upheaval significantly impacted the teaching methods, student performance, and the larger educational environment. The difficulties were severe in the Caribbean, especially in Guyana. In order to maintain continuity, the Caribbean Examinations Council (CXC) responded by implementing strategies, including online tests and altered testing formats (CXC Offering Online, 2020). However, the rapid change revealed structural flaws, such as a lack of long-term plans for integrating technology into education and inadequate digital infrastructure. As schools returned to physical classrooms, many educators reverted to pre-pandemic pedagogical techniques, raising worries about whether the achievements in digital and blended learning have been preserved.

At the heart of the current study was this conundrum: between the chance for change and the return to more traditional approaches. Existing literature highlighted the pandemic's opportunities as well as its problems. Hodges et al. (2020) and Moss et al. (2021), for example, emphasize how digital adaptation promoted creativity, increased home-school collaboration, and established technology as a practical instrument for high-quality instruction. In a similar vein, Sands and Sushok (2020) stressed that whereas some teachers found solace in conventional practices, others saw an opportunity to reinvent the way they teach. Building on Onyema's (2019) contention that methodological flexibility was necessary in dynamic learning contexts, this study examined whether educators in Guyana and the Caribbean have adopted long-term pedagogical change or have mostly reverted to pre-pandemic practices.

The study's pragmatic emphasis was mirrored in the mixed-methods approach chosen (Teddlie & Tashakkori, 2009). In order to answer difficult issues about whether pedagogical

advances from the pandemic era had been maintained or if practices had reverted to more conventional ways, pragmatism made it possible to integrate quantitative and qualitative techniques. While qualitative research revealed the contextual realities of instructional change and student adaptation, quantitative data offered a consistent and generalizable assessment of performance across schools and years. When combined, these techniques yielded a sophisticated and reliable analysis that would not have been possible with each strategy alone.

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The intricacy of the study challenge led to the original consideration of an explanatory sequential mixed-methods design. In addition to tracking improvements in student performance, this study looked into the teaching methods that contributed to those outcomes. Although quantitative data from national and regional exams provide a general picture of achievement trends, they were unable to adequately account for the causes of those changes or reflect the real-world experiences of teachers and students. On the other hand, qualitative reports lacked the capacity to record systemic changes across a number of years, but they may provide light on classroom practices and viewpoints on digital innovation. Therefore, a step-by-step method was required to integrate depth and breadth.

Secondary analysis of Caribbean Examinations Council (CXC) data on student performance in the 2019–2023 Caribbean Secondary Education Certificate (CSEC) exams was part of the quantitative strand. This time frame captured the temporal arc of disruption and recovery by encompassing the years just prior to, during, and following the COVID-19 pandemic. Regional and school-level disparities, subject-level differences (particularly in Mathematics and English A), overall performance trends, and the percentage of pupils who met the matriculation standard of five passes—including Mathematics and English A—were the main areas of concern.

In order to determine whether observed differences across groups and years were significant, the Statistical Package for the Social Sciences (SPSS) was utilized to produce descriptive statistics, including means, percentages, and standard deviations, as well as to perform inferential tests, including t-tests and analysis of variance (ANOVA) (Field, 2018). This stage was carried out in a post-positivist framework, stressing objectivity and reproducibility. It also provided the empirical foundation for the subsequent qualitative inquiry.

The purpose of the study's second phase was to provide context and explanation for the quantitative results. A purposive and stratified sample of teachers and students from three secondary schools in Guyana participated in semi-structured interviews and formal questionnaires to gather data. By using this method, the sample was guaranteed to represent variety in terms of topic matter, geography, and institutional setting. The surveys included data on exam preparation, teaching methods, and access to resources like digital gadgets and internet connectivity. Open-ended questions let participants explain their experiences in their own words, while Likert-scale items assessed attitudes. Themes identified by the quantitative data, such as challenges with online math training and differences in test-taking preparedness, were examined in semi-structured interviews. Participants were encouraged to consider both

innovations and problems by the flexible interview approach, which resulted in contextually grounded explanations for statistical trends.

The qualitative tools were guided by the quantitative results thanks to the explanatory sequential design. For example, interview methods included specific questions on the pedagogical approaches utilized in cases where performance data showed significant losses. At the interpretation step, integration took place as qualitative insights clarified the experiences and mechanisms behind statistical trends. By presenting qualitative ideas as essential to the overall interpretation, this approach refuted criticisms that mixed-methods studies frequently favor quantitative threads (Bergman, 2010).

The University Research Ethics Committee (UREC) granted ethical permission for the project. The study's objectives, methods, and participants' rights, including the freedom to discontinue participation at any time without incurring penalties, were explained to them. All identifying information was eliminated from transcripts and survey responses in order to strictly enforce confidentiality and anonymity. The delicate subject of talking about issues with student performance, equality, and technology access during a time of educational upheaval was handled with extra caution.

The research has a number of shortcomings in spite of its advantages. Self-reported data, which was used in the qualitative phase, was prone to social desirability bias and memory mistake (Podsakoff et al., 2003). The qualitative data provided transferability through extensive description, whereas the purposive sample added depth but limited the conclusions' generalizability. The study's concentration on three schools and geographic confinement to Guyana restricted its application to the larger Caribbean. The study's temporal analysis of data from 2019 to 2023 shed light on the pandemic's immediate aftermath, but not on the long-term course of educational reform.

This alignment is illustrated below, which shows how each goal is related to its

corresponding research topic.

| <b>Study Objective</b>   | <b>Corresponding Research Question</b>  |
|--|---|
| 1. To identify the pandemic-induced modifications in educational practice that have been sustained in Guyana's high schools, particularly regarding online and blended learning. | RQ1: What pandemic-induced modifications in educational practice have been sustained in High Schools in Guyana with regard to online education?         |
| 2. To analyze how teaching styles have differed among teachers in high schools across Guyana's diverse geographical areas.   | RQ2: How have the teaching styles of teachers differed in schools of different geographical areas of Guyana?  |
| 3. To assess how the evolving role of teachers has influenced student performance in high-stakes examinations, specifically the CSEC.  | RQ3: How has the changing role of teachers affected the performance of students at the CSEC Examinations?   |
| 4. To explore students' perspectives on changes in teaching strategies in the classroom compared to traditional pre-pandemic methods.  | RQ4: What changes have the students found in teaching strategies in the classrooms of teachers now compared to traditional methods before the pandemic? |
| 5. To propose measures to support and enhance teachers' instructional practices in the post-pandemic environment.  | RQ5: What measures can be put in place to ensure that teachers improve their teaching styles amidst the pandemic?                                       |

### **3.1 Research Approach and Design**

The research used an explanatory sequential mixed-methods design, meaning that qualitative investigation came after quantitative analysis. Because the study questions went beyond statistical description to comprehend the experiences and mechanisms that influenced student performance during the COVID-19 pandemic in Guyana, this approach was used. While the next qualitative phase investigated how educators and students experienced instructional changes and understood these results, the quantitative study of Caribbean Secondary Education Certificate (CSEC) results from 2019 to 2023 revealed broad trends. Thus, the explanatory sequential approach offered both breadth and depth of analysis, in keeping with Teddlie and Tashakkori's (2009) pragmatic paradigm, which stressed methodological selection depending on the requirements of the research challenge.

The choice to use a mixed-methods approach also demonstrated the epistemological position of the research. While qualitative research recognized the socially rooted and contextually complicated reality of educators and students, quantitative data provided a consistent, repeatable, and generalizable foundation for finding trends in student accomplishment. The study transcended the confines of a particular methodological viewpoint because pragmatism offered the underlying justification for combining various traditions.

In addition to identifying general trends in student performance, the study was able to investigate the underlying causes of those patterns, especially in light of the use of digital and hybrid learning, thanks to the explanatory sequential mixed-methods design. Pragmatic epistemology, which stresses method selection based on the research challenge rather than following a particular methodological tradition, is in line with this approach (Creswell & Plano Clark, 2018). The study was able to combine breadth by integrating quantitative and qualitative approaches, enabling both statistical generalizability and a context-rich

comprehension of educational improvements. Common complaints that mixed-methods research frequently favors quantitative data over qualitative insights were addressed by integrating these approaches at the interpretation stage, which further guaranteed that neither strand was overlooked (Bergman, 2010).

Given the extraordinary and complex nature of the changes to schooling brought on by COVID-19, the decision to utilize an explanatory sequential design was especially suitable. Complex social phenomena like pandemic-induced changes in education necessitate research designs that combine quantitative breadth and qualitative depth, claim Beckles-Clarke & Joseph-Edwards (2024). Construct validity and the study's interpretive power are improved by this design, which also permits iterative instrument improvement, guaranteeing that later qualitative stages are guided by preliminary quantitative discoveries.

The methodological design of this study was influenced by constructivist concepts, which framed the interpretation of student learning experiences and educator practices. The study looked at pandemic-related instructional adjustments in Guyana's secondary schools and their effects on CSEC performance via the perspective of constructivism, which places an emphasis on active knowledge building, scaffolding, and collaboration.

In the first stage, secondary data on student performance in the CSEC exams given between 2019 and 2023 were gathered and analyzed from the Caribbean Examinations Council (CXC). These tests served as a high-stakes evaluation that had a direct impact on post-secondary possibilities and were the most reliable indicator of secondary school performance in Guyana. Comparing the pre-pandemic, pandemic, and immediate post-pandemic eras was made possible by the five-year timeframe.

Overall pass rates, grade distributions, subject-level differences (especially in English A and Mathematics), and inequalities across schools and geographical areas were all analyzed. The percentage of pupils who met the matriculation threshold in five subjects,

including English and Mathematics, was given particular consideration. In order to ascertain whether differences between years or groups were statistically significant, the data were analyzed using the Statistical Package for the Social Sciences (SPSS), which enabled both descriptive statistics (means, percentages, and standard deviations) and inferential tests (t-tests and ANOVA) (Field, 2018). This quantitative strand placed a strong emphasis on generalizability and dependability within a post-positivist framework. But its main function was to spot performance patterns that needed more investigation using qualitative research.

By examining the real-life experiences of educators and students throughout the pandemic, the second part aimed to contextualize and explain the statistical trends. Semi-structured interviews and structured questionnaires were used to gather data. Surveys were designed to reach a larger audience and get opinions on online, hybrid, and in-person learning styles, test readiness, and availability to learning tools, including digital devices and internet connectivity. Open-ended questions permitted elaboration, whereas Likert-scale items measured perceptions.

A purposive and stratified sample of educators and students from three secondary schools participated in semi-structured interviews. Diversity in academic specialty, school type, and geographic location was guaranteed by this strategy. The interviews explored issues that surfaced from the quantitative data, including student motivation, disparities in access to learning resources, and challenges with online mathematics instruction. Participants were able to add more questions due to the semi-structured format's flexibility, which ensured that their opinions were heard while interpreting the findings.

The quantitative results had to directly inform the qualitative tools in order for the explanatory sequential design to work. For instance, interview protocols included specific questions on the pedagogical tactics educators used in mathematics when quantitative data showed declines in pass rates. The qualitative phase's specificity and relevance were

improved by this sequencing. Neither strand was marginalized since integration was placed at the interpretation step, when statistical patterns were explained using qualitative insights.

This design supported the claim made by Creswell & Plano Clark (2018) that explanatory sequential studies were especially helpful when contextual explanation is needed for quantitative trends. The study was able to provide a more nuanced view of how the pandemic changed educational results in Guyana by integrating data from standardized tests with the opinions of educators and students.

The research has a number of methodological issues. First, self-reported data, which were prone to social desirability bias and memory mistakes, were used in the qualitative strand (Podsakoff et al., 2003). Second, the results were not statistically generalizable outside of the chosen schools, even if deliberate and stratified sampling improved the depth of qualitative insights. Rather, they provided transferability through thorough explanation. Third, the amount of time and logistical resources needed to perform mixed-methods research limited the scope of data collection.

The scope of the investigation was similarly limited. It excluded other stakeholders like parents and legislators and was institutionally and geographically restricted to Guyana and three secondary schools. The study's temporal scope was limited to 2019–2023, which encompassed the immediate pandemic era but did not address the longer-term effects of educational recovery. In addition to defining the boundaries of generalization, these delimitations were required to preserve coherence and practicality.

A strong framework for investigating the effect of the COVID-19 pandemic on CSEC performance in Guyana was made available by the explanatory sequential mixed-methods design. While qualitative research provided contextual explanations based on educators' and students' experiences, quantitative analysis revealed noteworthy patterns of accomplishment. The study was able to make a significant contribution to our understanding of post-pandemic

educational outcomes because of the practical integration of techniques, which improved validity, reliability, and policy relevance.

### **3.2 Population and Sample of the Research Study**

In qualitative and mixed-methods research, figuring out the right sample size has long been acknowledged as a methodological difficulty. Qualitative research prioritizes depth, richness, and data saturation in contrast to quantitative methodologies, where sample size may be objectively established (Creswell & Creswell, 2018). Marshall (1996) pointed out that oversampling may squander resources without providing new insights, while under sampling ran the danger of providing insufficient representation. A guiding concept was data saturation, which is typically characterized as the moment at which no new themes arise (Creswell, 2013).

Both quantitative adequacy and qualitative depth were necessary for this investigation, which used an explanatory sequential mixed-methods design. Students and educators in grades 7 through 11 in Guyana's secondary schools made up the target population. Stratified sampling, which separated the population into strata according to demographic and geographic features, was used to guarantee representativeness. This strategy was developed to represent the economic, religious, and cultural diversity of Guyana's student body.

Stratified purposive sampling was used to guarantee that participants came from a variety of academic, cultural, and geographic backgrounds in Guyana. Because it made it possible to include individuals who were especially information-rich and pertinent to the research objectives, this sampling strategy also improved the reliability and transferability of qualitative findings (Patton, 2015). Methodological and practical factors were taken into account when determining the sample size.

In addition, practical limitations and ethical considerations were carefully taken into account while choosing participants. In order to ensure the collection of longitudinal insights on instructional changes, the inclusion criteria for students concentrated on those who had experienced both pre-pandemic and pandemic educational situations. A solid foundation for comprehending long-term pedagogical changes was provided by the selection of teacher participants, who were chosen based on their professional experience and continuity of instruction throughout the pandemic. While acknowledging limitations regarding broader generalization outside the selected population, these sampling strategies made sure that both quantitative generalizability within the schools and qualitative depth in understanding instructional experiences were achieved (Creswell, 2013).

About 20% of the typical student population (about 500) was represented by the 100 students chosen for the student sample from each institution. Proportionate representation by gender, social background, and geography was guaranteed by stratification. To ensure exposure to education before, during, and after the pandemic, only students who had been enrolled for at least four years were included. Since these students were socially and intellectually developed enough to reflect on their experiences, the 14–17 age group was deemed suitable. Although it was not possible to achieve a perfect gender balance, male students made up at least one-third of the sample. Due to their unique educational demands, which called for a different research, students with impairments were not included.

A minimum of a bachelor's degree and at least five years of teaching experience were prerequisites for inclusion in the teacher sample, which comprised 15–20 educators at each school. Teachers who have taught both before and after the pandemic were guaranteed to participate. In order to gather institutional viewpoints on the implementation of policies and school-wide adaptation, interviews were conducted with senior educators, including Head Teachers, Deputies, Heads of Departments, and Senior Masters/Mistresses. They were able

to consider both systemic and classroom-level effects because of their administrative and supervisory responsibilities.

There were around 350 participants in the final sample, which included educators as well as students. This size allowed for qualitative depth through surveys and interviews while supporting quantitative generalization within the chosen schools. According to Mills et al. (2009), the study goals, rather than arbitrary numerical thresholds, were used to select the sample size. In accordance with the guidelines of explanatory sequential mixed-methods research, the study obtained representativeness and information-rich instances by combining stratified sampling with purposive selection of senior educators.

Although validity was improved by stratification and explicit inclusion criteria, some restrictions persisted. The results' applicability was limited by the emphasis on mainstream pupils, which left out students with impairments. Additionally, the regional focus on certain schools limited the generalizability outside of Guyana. Furthermore, the use of self-reported data increased the possibility of social desirability bias and memory. Multiple data sources (interviews, surveys, and exam results) were triangulated to reduce these risks.

### **3.3 *Materials/Instrumentation of Research Tools***

The accuracy, validity, and dependability of the data collection tools are crucial to the quality of any empirical investigation. A combination of quantitative and qualitative measures was developed, improved, and verified for this study, which explores how the COVID-19 pandemic affected teacher roles, pedagogical practices, and student learning experiences in Guyana. These tools included direct classroom observations, semi-structured interviews with senior educators, formal teacher and student questionnaires, and official documented data. The results were guaranteed to represent both quantifiable trends and the actual experiences of important educational stakeholders thanks to the triangulation of these

instruments.

### **3.3.1 Quantitative Instruments**

Documentary and survey data were the main sources of information used in the quantitative phase. The first source of information was official records from the Caribbean Examinations Council (CXC) and the Guyana Ministry of Education. Grade profiles, subject distributions, and pass rates at the Caribbean Secondary Education Certificate (CSEC) level across a number of academic years were among these archive materials. These papers were chosen because they are the most trustworthy, consistent, and pertinent indicators of student growth and accomplishment (Johnson & Christensen, 2019).

Examining longitudinal patterns in student performance prior to, during, and following the pandemic was made possible by the CSEC data. The data was broken down by exam year, gender, and geographic region (rural versus urban schools). The results were standardized and classified for statistical analysis in order to facilitate comparison and reduce variations in data formats. The researcher was able to link changes in pedagogical techniques with corresponding variations in learning results by using documentation data from official educational authorities, which also guaranteed correctness and decreased self-report bias.

Teachers and students were given structured questionnaires to supplement these official records.

The purpose of the questionnaires was to collect measurable indications of learning engagement, teacher adaption, and technological integration during remote and hybrid instruction. Both closed-ended and open-ended questions about technology availability, online involvement frequency, perceptions of instructional support, and self-reported academic difficulties were included in the student version. Perceptions of student motivation, assessment changes, digital literacy, and the changing nature of professional obligations both

during and after school closures were all measured by the teacher questionnaire.

These surveys were designed in accordance with accepted survey research principles. The conceptual framework of the study served as the basis for the construction of the items, which were then examined to guarantee face and construct validity. Both statistical measurement and qualitative elaboration were made possible by the combination of open-ended prompts with closed-ended Likert-type scales, resulting in what Bryman (2016) refers to as "quantifiable narratives." By connecting numerical answers with participants' subjective accounts, this mixed-question design enhanced the analysis and supported triangulation within a single instrument.

### **3.3.2 Qualitative Instruments**

By gathering in-depth, thoughtful accounts from individuals most directly involved in the educational process, the qualitative component aimed to enhance comprehension of the changes found quantitatively. Semi-structured interviews, structured questionnaires with open-ended questions, and classroom observations were the three primary qualitative methods used.

Senior teachers, including head teachers, deputy head teachers, department heads, and senior masters or mistresses, were interviewed in a semi-structured manner. Because these educators work in roles that provide them a dual perspective—as administrative executives supervising pedagogical implementation and as classroom practitioners—purposive sampling was employed.

The interview guide was thoughtfully created to strike a balance between rigidity and adaptability. Teachers' opinions of students' participation in remote and hybrid learning environments, modifications to curriculum delivery and evaluation, institutional reactions to the pandemic, utilization of digital technologies and educational platforms, and thoughts on

problems and professional development.

The questions were arranged to promote introspection while keeping the study's theoretical framework about constructivist, connectivist, and socio-cultural aspects of learning front and center. Because it allows researchers to explore new subjects while guaranteeing coverage of pre-identified themes, the semi-structured format was chosen (Kvale & Brinkmann, 2015). Finding subtle insights into how teachers reinterpreted their instructional identities throughout the pandemic required this flexibility.

With the participants' permission, audio recordings of the interviews were made, which were then verbatim transcribed. Thematic analysis concepts served as a guide for the coding process, which focused on recurring themes in the interviews. An inter-rater reliability procedure was used to reduce researcher bias, in which a different researcher independently coded a subset of transcripts to confirm consistency.

The questionnaires were mostly quantitative, but they also had qualitative parts that let respondents go into more detail about particular situations. Because open-ended questions were included, respondents were able to share personal narratives that numerical responses could have missed. For example, students could discuss the emotional and motivational difficulties of home-based learning, while teachers could explain how they adapted course delivery in the face of erratic internet connectivity. By providing contextual explanations for statistical differences, such qualitative input enhanced the interpretation of quantitative patterns.

After in-person instruction resumed, direct classroom observations were made in a few chosen schools to further triangulate data. Teaching methods, student engagement levels, and the use of technology in in-person and blended learning settings were the main topics of the observation schedule. A standardized technique based on Patton (2015) was used to direct observations, with a focus on methodical recording and minimizing observer bias.

This tool offered a priceless contextual view. Classroom observations confirmed how instructional techniques developed in actual circumstances, while questionnaires and interviews recorded perceptions. Along with matching interview and survey data, observational notes were coded according to instructional method (e.g., collaborative learning, teacher-centered instruction, and technology-assisted facilitation). By verifying that reported actions matched observed practices, observational data improved the study's internal validity.

### ***3.3.3 Instrument Development and Validation***

All instruments were developed through a rigorous, multi-phase process that prioritized cultural relevance, validity, and reliability. To make sure each tool accurately captured the constructs being studied, it underwent expert review, pilot testing, and iterative refining. The degree to which an instrument measures what it claims to measure is referred to in this study as validity. Various types of validity were evaluated:

1. **Face Validity:** In order to demonstrate face validity, drafts of the measures were sent to a panel of seasoned researchers and educators who assessed if the items seemed pertinent and suitable for the Guyanese educational setting (Bhattacharjee, 2012). In order to improve clarity and relevance for educators and students who are familiar with the Caribbean curriculum, this panel's feedback led to changes in phrasing.
2. **Construct Validity:** By matching interview and questionnaire items to theoretical concepts like instructional innovation, student involvement, and teacher adaptation, construct validity was established. These concepts were drawn from constructivism and transformational leadership, two educational philosophies that served as the study's foundation. In order to ensure that empirical measurements were conceptually grounded, each item was mapped to conceptual variables using the method suggested by Anderson and

Sellbom (2015).

3. **Content Validity:** A thorough professional assessment strengthened the content validity. To make sure that all pertinent facets of teaching roles, instructional approaches, and student experiences were sufficiently represented, a team of education specialists reviewed the instruments (DeVon et al., 2007). Items that were deemed unnecessary or incidental were eliminated, and reviewers filled in any gaps with new questions to address dimensions that were missed.

4. **Criterion Validity:** To guarantee compliance with accepted measurement standards, the study instruments were, when appropriate, compared with established scales and indicators used in earlier educational research (Morisky et al., 2008). The operational definitions of concepts like "student engagement" and "teacher adaptation" were found to be in line with accepted academic standards, according to this comparative analysis.

The consistency and stability of an instrument's outcomes across time or among assessors is referred to as reliability. A number of actions were taken:

- **Internal Consistency:** To evaluate internal consistency, Cronbach's alpha coefficients were calculated for the surveys' multi-item scales. According to Field (2013), satisfactory reliability was defined as a threshold of 0.70 or greater.

- **Inter-Rater Reliability:** Selected interview transcripts were independently examined by several coders for qualitative data. To improve dependability and guarantee consistent theme interpretation, coding inconsistencies were examined and resolved.

- **Test-Retest Reliability:** To assess stability over time, pilot participants answered a few survey questions again, separated by a few weeks. Reliability was found to be satisfactory when there was little fluctuation between responses.

- **Standardized Observation Protocols:** To minimize researcher subjectivity and guarantee that observations were similar, observation forms were organized and consistently used

across sites.

When combined, these processes gave assurance that the data gathering tools were reliable and accurate.

### **3.3.4 Pilot Testing**

A small, representative sample of teachers and children participated in pilot testing of the instruments prior to their complete deployment. The objective was to assess the items' comprehensibility, relevancy, and clarity as well as the administrative logistical viability. Pilot input was utilized to improve the question's language, order, and response alternatives in accordance with Magnusson and Maracek (2015).

Given Guyana's multilingual environment and variety of educational settings, special emphasis was given to linguistic clarity and cultural appropriateness. Questions were modified to make them comprehensible to individuals from various geographic locations and socioeconomic backgrounds. Items on the student questionnaire were examined for age appropriateness to make sure they could be read by students between the ages of 14 and 17.

Online formats' accessibility was also evaluated through pilot testing. Survey instruments were digitized utilizing secure internet platforms because some data collecting took place during periods of sporadic distant learning. Contingency preparations that included paper-based alternatives for schools in places with poor connectivity were prompted by the pilot's identification of technical issues like unreliable internet availability.

By ensuring that each instrument generated responses consistent with the theoretical characteristics being measured, the iterative pilot procedure not only improved the tools' language and structural quality but also strengthened construct validity.

### **3.3.5 Integration and Triangulation of Instruments**

The research equipment' design was integrative by nature. In addition to addressing a distinct aspect of the research topics, each tool; documentary data, questionnaires, interviews, and observations also purposefully overlapped to enable cross-validation.

- Documentary data provided impartial, long-term proof of academic achievement.
- A large sample's perceptions and experiences were measured using questionnaires.
- These patterns were given depth and insight through interviews.
- Findings were grounded in observable classroom behavior through observations.

Internal and external validity were improved by triangulating among these instruments (Patton, 2015). While differences led to more in-depth interpretive research, patterns found in quantitative data were clarified and supported by qualitative observations. This method yielded a thorough, multifaceted knowledge of how pandemic conditions altered educational methods and results.

In order to capture both the quantifiable and experiential dimensions of educational transformation during the COVID-19 pandemic in Guyana, this study used a methodologically rigorous suite of tools. The instruments were able to strike a compromise between contextual sensitivity and empirical precision through meticulous validation, reliability testing, and cultural adaption. Robust triangulation was made possible by the integration of quantitative and qualitative indicators, guaranteeing that results were both statistically supported and meaningfully comprehended. Together, these tools served as the research's empirical foundation, supporting its objective of clarifying the long-term institutional and pedagogical changes brought about by the pandemic.

### **3.4 Operational Definition of Variables**

To make sure that the ideas being studied were described in a way that allowed for accurate and valid measurement, it was crucial to operationalize the variables. This study looked into how the COVID-19 pandemic affected Guyana's high school teachers' responsibilities and teaching strategies, paying special emphasis to whether these changes were short-term adjustments or long-term pedagogical modifications. To operationalize the independent and dependent variables in a way that matched the study objectives and hypotheses, a mixed-methods approach was used.

Systematic comparison between pre-, during, and after the COVID-19 pandemic was made possible by operationalizing the pandemic as a categorical independent variable. This made it possible for the study to separate how pandemic-related interruptions affected instructional strategies and student performance (Onyema, 2019). Ordinal measures derived from survey responses, Likert scales, and systematic classroom observations were used to operationalize the dependent variables, which were educators' responsibilities and pedagogical practices.

Indicators of instructional delivery, professional engagement, and response to a range of student needs were used to gauge teachers' roles. Measures of pedagogical approaches, such as technology integration, inquiry-based instruction, collaborative learning, and lecture-based methods, were used to record teaching tactics (Darling-Hammond et al., 2020). The study improved internal validity and the interpretive power of mixed-methods analysis by precisely defining these factors and connecting them to quantifiable results.

A comprehensive comparison of teaching tactics before, during, and after the pandemic was made easier by operationalizing the pandemic as a categorical variable. This would allow the study to determine empirically whether the changes were short-term adjustments or a sign of long-term pedagogical changes. This strategy is in line with

Creswell and Plano Clark's (2018) suggestions for explanatory sequential designs, where operationalizing variables guarantees quantifiable, analyzable results while staying true to theoretical frameworks.

The global COVID-19 pandemic (*an independent variable*), which had major social and educational repercussions, served as the independent variable. The pandemic was operationalized in this study as a categorical variable that distinguished between two time periods: the Pre-pandemic era, the years before 2020, when in-person, conventional education methods predominated. Pandemic period: from 2020 forward, when health precautions and school closures made remote, online, or hybrid teaching and learning methods necessary. A methodical comparison of teacher responsibilities and educational practices prior to and after the pandemic was made possible by this operationalization. The study evaluated whether teaching techniques changed during the pandemic and if these changes continued after the crisis ended by considering the pandemic as a categorical variable.

Teachers' instructional techniques, which were operationalized across two interconnected dimensions teachers' roles and teaching methods were the dependent variable. Ordinal measures developed from surveys, classroom observations, and interviews were used to quantify both dimensions. These assessments provide quantitative and qualitative information about pedagogical modifications, instructional strategies, and teacher engagement during the pandemic.

## **Role of Teachers**

Both within and outside of the classroom, teachers' duties included professional responsibility, engagement, and perceived efficacy. According to Shulman's framework (1987), a teacher's responsibilities included managing the classroom, encouraging student participation, attending to a range of learning needs, and supporting professional growth. Survey questions and observational procedures evaluated educators' duties, levels of engagement, and efficacy in carrying them out in order to operationalize this variable.

Information about the roles of educators was gathered from a variety of sources, including administrators, parents, and students. On a Likert-type scale ranging from 1 (poor engagement and effectiveness) to 5 (great engagement and effectiveness), respondents were asked to score the performance of teachers. "The teacher actively manages classroom learning environments" and "The teacher effectively engages with students outside of class hours" were two examples. In order to compare perceived engagement and efficacy across the two times, the ratings were combined to give ordinal measures of teacher responsibility prior to and during the pandemic.

Direct proof of teachers' involvement with pupils was provided via classroom observations, which complemented survey data. Using established procedures to guarantee uniformity, observers recorded tasks such as classroom management, student involvement, and instructional support. A more complex understanding of educators' roles in practice was made possible by these observations, which also made it possible to triangulate survey responses.

## **Teaching Methods**

Teaching methods referred to the specific pedagogical strategies employed to facilitate student learning. These included inquiry-based learning, collaborative learning, lecture-based education, and technology-supported approaches, all of which are in line with Darling-Hammond et al. (2020). Operationalizing this concept was essential to capture the pedagogical changes being studied, as the pandemic hastened the uptake of digital technologies and blended learning. Both survey tools and classroom observations were used to assess teaching strategies. Students used a five-point ordinal scale to score the frequency and perceived efficacy of different instructional methods on questionnaires. Additionally, under the direction of a standardized observation procedure, systematic classroom observations were carried out to document the real-world use of teaching tactics. By recording the occurrence and frequency of strategies, including group projects, digital integration, and direct instruction, this procedure produced triangulated proof of instructional strategies.

## ***Hypotheses***

The operationalization of variables was guided by two hypotheses:

### ***The Roles of Teachers***

**H0:** The responsibilities that educators played before and throughout the pandemic did not alter significantly.

**H1:** The responsibilities that educators performed before and throughout the pandemic differed significantly.

### ***Teaching Methods***

**H0:** The instructional strategies used before and during the pandemic did not alter significantly.

**H1:** The teaching strategies used before and during the pandemic differed

significantly.

The choice of statistical analysis, which comprised both descriptive and inferential techniques, was influenced by these hypotheses. The ordinal survey data was summarized using descriptive statistics, such as means and standard deviations, which gave an overview of the instructional tactics and perceived teacher engagement. To examine variations in teacher roles and instructional strategies across the two time periods, inferential statistics such as ANOVA and t-tests were utilized. In order to determine if more involved teachers adopted various instructional techniques more consistently, correlation studies looked at relationships between teacher engagement and the frequency of particular pedagogical strategies.

The impact of COVID-19 on high school teaching may be precisely measured thanks to the operationalization of the independent and dependent variables. The study methodically recorded changes in pedagogy and engagement over two different time periods by defining teachers' responsibilities and instructional strategies with quantifiable indicators. This method offered empirical proof of both immediate and long-term modifications to instructional strategies. The results of this operationalization have consequences for future disaster preparedness, teacher preparation, and educational policy. In addition to offering advice for promoting successful pedagogical practices in post-pandemic and hybrid learning environments, they highlight the manner in which educators adjusted to disruptions caused by the pandemic. A foundation for further research on instructional adaptation in response to significant interruptions in education is also provided by this study.

This study's operationalization of variables offered a solid methodological basis for examining how the COVID-19 pandemic affected high school instruction in Guyana. The study documented the breadth and depth of changes in teacher responsibilities and instructional methods by combining data from quantitative surveys, classroom observations, and qualitative interviews. The results were solid, understandable, and significant for guiding

educational policy and practice thanks to the mixed-methods approach and close attention to validity and reliability.

### **3.5 Study Procedures and Ethical Assurances**

Every stage of this research, from design and participant recruitment to data collection, analysis, and reporting, was conducted with ethical integrity at its core. This study involved professionals whose personal and professional thoughts held institutional and emotional relevance since it examined teachers' changing responsibilities and instructional practices during and after the COVID-19 pandemic. Therefore, protecting the welfare, rights, and dignity of participants was crucial. The Belmont Report (National Commission for the Protection of Human Subjects, 1979) and the British Educational Research Association's Ethical Guidelines for Educational Research (BERA, 2018) both outlined internationally accepted principles of educational research, such as respect for autonomy, beneficence, non-maleficence, and justice, which served as the foundation for this study's ethical framework.

Ethical guidelines must be strictly followed while doing research with human subjects, especially when the study aims to document experiences that could be delicate, private, or connected to systemic disturbances as those brought on by the COVID-19 pandemic. Every step of the research process, from study design, participant recruitment, and data collection to analysis, reporting, and dissemination, was meticulously designed with ethical concerns in mind. This study examined the effects of the pandemic on teaching and learning in Guyana. The integrity, validity, and reliability of the study findings were improved by ethical assurance, which was not viewed as merely a procedural need.

The study was subjected to a thorough ethical assessment before data collection. Oversight was given by the University Research Ethics Committee (UREC) to guarantee that participant risks were kept to a minimum and that measures were used to protect their rights

and dignity. After carefully reviewing the research concept, tools, and processes, the UREC awarded ethical clearance on December 15, 2023. The researcher had to fulfill certain requirements in order to receive this approval, such as getting informed consent, maintaining anonymity, and maintaining confidentiality at all times (Israel & Hay, 2006).

Because the study included both professors and students obtaining UREC permission was very crucial. In order to protect children's fragility, ethical research involving them needs more sensitivity and two levels of agreement: parental consent and student assent (Alderson & Morrow, 2020). UREC further underlined the significance of openness and continual ethical compliance monitoring. The researcher's reflexive approach was formed by this advice, which ensured that ethical assurance was constantly reexamined during the investigation.

Other institutional permits were requested after UREC clearance. An official Gatekeeper letter asking for permission to conduct the research at Queen's College, St. Roses High School, and Charity Secondary School was delivered to the Ministry of Education's Chief Education Officer (CEO) on December 16, 2023. On December 17, 2023, the CEO approved via email (see Appendix 2) and then notified the principals of the chosen schools. It was essential to establish good contact with principals since their assistance made it easier to recruit participants, make logistical preparations, and foster trust in school communities.

Beyond formal compliance, ethical rigor influenced every step of the research process, from recruiting participants to gathering and storing data. Protecting children was given special consideration, necessitating both parental and student consent. By using coding mechanisms, safe digital storage, and cautious handling of paper-based surveys, confidentiality and anonymity were rigorously maintained.

Several precautions were made to avoid discomfort or upset even though there was little physical or psychological risk associated with this investigation. Talking about the

difficulties one faced at work during the pandemic may cause feelings of stress, tiredness, or institutional pressures. In order to mitigate this risk, the researcher established a compassionate and encouraging setting where individuals felt free to share their experiences. Participants were informed throughout the interview process that they might end the session at any moment or refuse questions. The researcher avoided questioning participants beyond their comfort zones while maintaining a composed and courteous manner. At the conclusion of each interview, there was a debriefing when participants could clarify or recant statements if they so desired.

Additionally, the study carefully considered the ethical issues surrounding teacher evaluation. The researcher stressed the non-evaluative nature of classroom observations because they could be mistakenly interpreted as performance evaluations. Discreet and inconspicuous, observations were made with an emphasis on teaching methods rather than individual proficiency. In order to ensure accuracy and contextual integrity prior to analysis, teachers were given the opportunity to examine and comment on observation summaries.

In order to detect and lessen any biases in data collection and interpretation, the researcher kept a reflective notebook and integrated reflexivity and positionality into the study. Credibility and dependability were further enhanced by methodological triangulation, which combined surveys, interviews, and observations. Additional validation of findings was obtained by peer debriefing and communication with subject-matter experts, guaranteeing accountability and transparency throughout the study.

Ethical practice was viewed as a continuous process of reflection and attentiveness rather than as a one-time event. Researchers must constantly assess and modify ethical methods to fit contextual circumstances, according to Guillemin and Gillam (2004). The Guyanese environment ensured that all individuals could participate effectively without compulsion or undue influence by taking into account cultural variety, linguistic disparities,

and the sensitivity of minors.

The researcher conducted virtual meetings and phone conversations with the principals of the three participating schools to operationalize the study. Principals were allowed to voice any concerns or questions during these talks, which covered the study's objectives, importance, and methods. By ensuring that the study adhered to school-level procedures and respected institutional regulations, this participation strengthened openness and cooperation. Potential power disparities between the researcher and the school community were lessened through this relational strategy (Mertens, 2020).

Although the researcher took intentional measures to prevent undue influence on educators and pupils, the administrators served as gatekeepers. The research aimed to lessen any implicit pressures that could occur in hierarchical educational environments by making it clear that participation was entirely voluntary and unrelated to academic achievement or professional appraisal. A guiding theme that pervaded the whole process was respect for participant autonomy.

To guarantee representativeness across the three schools, stratified sampling was used in the teacher recruitment process. Fifty (50) educators in all were chosen because they fulfilled certain requirements: they had to have taught a class for the Caribbean Secondary Education Certificate (CSEC), had at least an Associate Degree in Education, and have been employed at their school for at least four years. These requirements made sure that participants had enough work experience to offer trustworthy opinions on how to adjust instruction both during and after the pandemic.

Additionally, students who belonged to cohorts that went to school prior to, during, and following the pandemic were included. The research was able to record longitudinal changes in experiences and results because of this methodology. The researcher collaborated extensively with school administrators to get parental agreement because the subjects were

minors. Consent papers that included comprehensive details about the study's goals, procedures, dangers, and participants' rights were delivered by principals and educators. Additionally, students were asked for their consent, highlighting the fact that participation was entirely voluntary.

As an ethical procedure that ensures understanding, voluntariness, and respect, informed consent was viewed as more than just a formality (Dawson, 2019). Clear written and verbal explanations of the study's purpose, participants' rights to confidentiality, their freedom to discontinue involvement at any time, and the lack of consequences for non-participation were given to them. Since ethical norms stress the shared obligation of educating parents and pupils, special attention was paid to students. To improve comprehension, consent forms were written in plain English rather than technical jargon. Parents received assurances that their children would not suffer any negative effects if they chose not to participate.

There was constant reinforcement of the autonomy concept, which is essential to ethical research. Despite the fact that none of the participants used their right to withdraw, having this choice created a trustworthy atmosphere. This autonomy guarantees that participants were not compelled or exploited, which is consistent with more general research ethical standards of justice and fairness. Between December 18, 2023, and January 18, 2024, data was gathered. In order to provide flexibility in answer forms, teachers and students were given access to both hard copies and digital copies of the surveys (Google Forms).

In order to promote equal participation, hard copy surveys were given priority due to the recognition of infrastructure discrepancies, especially in remote regions like Charity Secondary School, where internet availability was restricted. By removing identifying information from both forms, anonymity was maintained. Google Forms was set up to minimize unintentional data linking by avoiding email logins. Names and other personal

identifiers were not included in hard copy surveys. In order to prevent peer or teacher influence, students returned physical forms through designated collection boxes, while teachers entered comments anonymously. These actions promoted open communication and strengthened confidentiality (Kaiser, 2009).

Teachers, department heads, and senior masters/mistresses participated in semi-structured interviews to gather qualitative data in addition to questionnaires. Interviews were done over the phone in order to respect participants' schedules and minimize any possible interruptions. This approach offered flexibility and, surprisingly, an extra degree of anonymity because participants frequently felt more at ease expressing their thoughts without direct communication.

Confidentiality of participants was maintained at all times. Codes (e.g., Teacher A, Student B) were used to anonymize responses and applied to survey data and transcripts. To ensure that results could not be linked to specific people or organizations, no identifying information was used in the research or reporting (Wiles, 2012). Digital files were stored on a password-protected computer and backed up to an encrypted external hard drive, while physical documents were kept in locked cabinets accessible only to the researcher. These actions were in accordance with digital research ethical best practices (Buchanan & Zimmer, 2019)

Given the power dynamics in teacher-student interactions and the emotional toll of the pandemic, working with students presented special ethical issues. Data gathering instruments were designed to be age-appropriate and concise to minimize hazards. Both orally and in writing, students were informed that participation was completely voluntary and that they may choose not to answer any questions or to stop participating altogether. Parents, educators, and administrators were careful not to coerce pupils into taking part.

The cultural background of Guyana, a multiethnic nation where educational

experiences might vary among populations, was also taken into consideration in the study. Throughout the hiring and communication processes, sensitivity to linguistic diversity and cultural norms was maintained. The researcher's positionality and any biases were also covered by ethical assurance. In order to detect and lessen the impact of individual presumptions on data collection and interpretation, reflexivity was exercised through journaling and continuous self-evaluation.

By decreasing dependence on a single source of evidence, methodological triangulation, the integration of quantitative survey data with qualitative interviews, further increased credibility (Creswell & Creswell, 2017). Additional checks were made through peer debriefing and subject-matter expert consultation, which strengthened validity and helped identify blind. The entire study procedure was conducted transparently. To guarantee accountability and reproducibility, careful documentation of the hiring process, permission processes, and data management was kept. Findings were reported truthfully, without adornment, and with acknowledgment of their limitations, including possible response bias and contextual limits.

Even with meticulous preparation, a number of moral dilemmas surfaced. It was logistically challenging to distribute and retrieve questionnaires in rural locations with spotty internet. By working with school personnel and offering paper-based substitutes, this was lessened. Making sure that children didn't feel under pressure to engage because of the involvement of principals or educators was another difficulty. Consent paperwork with guarantees and repeated verbal reminders helped allay this worry. In tiny school groups, anonymity also needed special attention since people can be recognized by their reactions or positions. To protect identities, aggregated reporting and the omission of sensitive information were used.

The integration of qualitative and quantitative datasets in the explanatory sequential

mixed-method design requires special attention. By making sure that data linking would not jeopardize anonymity, ethical accountability was maintained. To link qualitative insights with quantitative variables, codes were employed instead of personal identifiers. This method avoided unintentional participant re-identification and maintained anonymity even throughout intricate analysis phases. In order to ensure that ethical principles guided not only data collection but also synthesis and interpretation, integration was carried out strictly at the level of themes and statistical trends rather than individual cases.

According to Guillemin and Gillam (2004), ethical research is a continuous process of vigilance and adaptation rather than a one-time compliance effort. To improve ethical practice, the researcher undertook ongoing professional development activities, such as reading current ethical literature and getting peer input. By ensuring that new ethical concerns were swiftly addressed, reflexive monitoring maintained the study's integrity in accordance with the highest standards. The protocols and ethical guarantees of the study were based on a strong dedication to upholding rigor, encouraging transparency, and protecting participant rights. The study showed respect for both procedural and substantive ethical standards, from obtaining UREC permission to creating culturally appropriate consent procedures, maintaining anonymity, and engaging in reflexivity. By incorporating ethics into the mixed-methods design, the study improved the validity and reliability of its conclusions while simultaneously protecting the welfare and dignity of its participants.

In conclusion, this study's ethical rigor ensured that its findings offered reliable and significant insights into the COVID-19 pandemic's effects on schooling in Guyana. This section demonstrates how ethical assurance, when included in study design and execution, is not just a necessity for compliance but also an essential part of creating scholarship that is socially responsible, respectful, and credible.

### **3.6 Data Collection and Analysis**

Teachers, students, and parents with firsthand experience of high school education over both times were given survey instruments. To improve validity and reliability, items were modified from validated measures in the literature. On Likert-type scales, respondents recorded opinions about the roles and methods of instruction of educators. In order to represent Guyana's urban and rural environments, a selective sample of high schools was chosen for classroom observations. Pedagogical tactics were observed in action, documenting contextual elements including student involvement and technological integration in addition to usage frequency. This two-pronged strategy guaranteed a complete dataset.

Descriptive and inferential statistics were used to examine quantitative data. A summary of the patterns throughout the two time periods was given via descriptive statistics, such as averages and standard deviations. To find out if there were statistically significant variations between teaching roles and practices before and after the pandemic, inferential techniques were used, mainly independent-samples t-tests and ANOVA. Additionally, correlation analysis was used to look at relationships between teacher involvement levels and the use of certain teaching strategies. Thematic analysis was used to find patterns in teaching methods and how they matched or deviated from student views using qualitative data from classroom observations. To improve validity and capture both perceived and real pedagogical shifts, these data were triangulated with the survey results.

A thorough grasp of the extent of changes in teaching methods as well as the contextual elements causing those changes was made possible by the triangulation of various data strands. By connecting statistical patterns in student performance with teachers' adaptations, resource availability, and student experiences, the study was able to fully address the research questions through the integration of quantitative and qualitative findings. By

offering practical insights into post-pandemic educational techniques and policy ramifications, this complementarity improved the study's explanatory power.

The study was able to capture the intricacy of teaching both during and after the pandemic by operationalizing the variables in this dual approach. Observations contributed contextual depth and subtlety, while survey data offered breadth and generalizability. This integration ensured that lived experiences in classrooms supported the statistical evidence of changes in teaching roles and approaches. According to the methodological complementarity argument put out by Creswell and Plano Clark (2018), this strategy improved the findings' credibility and explanatory capacity.

This study systematically investigated the degree to which the COVID-19 pandemic changed high school pedagogy in Guyana by operationalizing the pandemic as a categorical independent variable and teaching roles and practices as ordinal dependent variables. A thorough examination of whether these modifications were short-term reactions to crises or signs of longer-term shifts in educational practice was made possible by the methodological decisions made. In this study, both qualitative and quantitative data were examined using analytical methods that matched each research topic. While qualitative insights provide light on the underlying causes of observed changes, the use of mixed approaches ensured that numerical patterns were carefully addressed.

*For research question one*, Senior teacher interviews were conducted in addition to data collected from teacher and student surveys to examine the long-term adjustments educators made to their teaching methods during the pandemic. Descriptive analysis, including means, minimum and maximum values, and standard deviations, was performed on quantitative responses that had been entered in SPSS. A summary of the replies' central tendency and dispersion was given by these metrics. The primary educational changes that continued after the pandemic were identified thanks to the tabulation and graphic display of

the results. In order to ensure methodological triangulation, the qualitative interview data provided context for these findings by elucidating the reasons behind the maintenance of certain adaptations.

*The second question* looked at whether there were regional differences in Guyana's teaching methods. The dataset, which came from surveys and interviews, was coded and subjected to descriptive statistical analysis in SPSS. The research examined frequency and central tendency indicators across groups because of the differences in resources and connectivity between the coastal plain and the hinterland. To illustrate the differences in pedagogical dependence on traditional vs technologically enabled methodologies, the results were displayed in tabular and histogram representations. By elucidating the environmental and structural limitations that influenced these regional variations, interviews enhanced the analysis.

Using CSEC performance data from 2019–2023, *the third question* evaluated how shifting instructor positions affected student results. SPSS trend analysis was used to assemble and examine the archival results. Block graphs provided an impartial assessment of patterns in student performance by showing variations across pre-pandemic, pandemic, and recovery periods. The study was able to investigate whether changes in practice were associated with increases or decreases in academic attainment by connecting these data to changes in teacher roles.

Students' opinions of pedagogical changes were the subject of *the fourth question*. SPSS was used to tabulate and analyze the survey data. To determine if there were statistically significant correlations between the pandemic and the observed changes in teaching methods, a chi-square test was used. Additionally, this test made it possible to find connections between pandemic symptoms and modifications to the way that education is delivered. The study was enhanced by graphic representations that showed trends in the

viewpoints of the students over the three time periods examined.

How the teaching methods were further enhanced was examined in *the fifth question*. Thematic analysis was used to examine interview and open-ended questionnaire data, adhering to the six-phase framework developed by Braun and Clarke (2006). Strengths, shortcomings, neutral impressions, and non-applicable replies were the categories into which the responses were methodically classified. Iteratively, codes were transformed into themes, which were then examined and finished in accordance with the Means et al. (2014) framework for online learning design. This procedure preserved the intricacy of the participants' viewpoints while guaranteeing analytical rigor. Following that, the themes were combined to provide suggestions for improving teaching methods in the wake of the pandemic.

When managing huge datasets, the use of SPSS for quantitative data guaranteed accuracy, efficiency, and repeatability. Robust metrics for analyzing central trends, dispersion, and relationships pertinent to the first four study topics were offered by descriptive and inferential statistics. In contrast, Research Question Five, which needed an inductive study of recurrent patterns from open-ended qualitative data, was a good fit for thematic analysis. With qualitative discoveries offering depth in explanation and quantitative data demonstrating patterns, this dual method guaranteed complementarity.

### **3.7 Summary**

The long-term changes in teachers' roles and teaching methods after the COVID-19 pandemic were examined in this study using an explanatory sequential mixed-methods approach. The methodological framework was chosen to offer a comprehensive and in-depth study of how the pandemic affected secondary education in the Caribbean. A qualitative phase to detect developing themes and contextual subtleties was made possible by the

sequential approach, which was followed by a quantitative phase to test and generalize these findings to a larger population. The quantitative tools were based on teachers' real post-pandemic experiences thanks to this two-phase structure.

Secondary school teachers from various Caribbean contexts made up the study population. Participants were chosen through purposive sampling based on their direct involvement in classroom instruction both during and after the pandemic. There were two connected steps to the data collection process. In order to investigate changes in teaching methods, technology integration, and changing professional duties, the first phase used qualitative approaches, particularly semi-structured interviews and classroom observations. The second phase, in which standardized questionnaires were created and given to a larger sample, was built upon these qualitative discoveries. A thorough grasp of how instructional practices and teacher responsibilities changed in response to global educational disruption was made possible by this sequential integration, which improved the dependability and complementarity of both data strands.

The COVID-19 pandemic was operationalized as a categorical construct that distinguished between the pre-pandemic, pandemic, and post-pandemic eras. Using ordinal scales that reflected differences in curriculum delivery, classroom management, technology use, and student engagement tactics, dependent variables included educators' professional responsibilities and instructional practices. Both felt and visible changes in these factors were recorded in data gathered through surveys and observations. Cross-validation was made possible by the mixed-methods methodology, which allowed for the alignment of quantitative evidence of observable change with qualitative findings on role redefinition and instructional adaptation.

Descriptive and inferential statistical methods were used to assess quantitative data. While inferential studies like t-tests, regression, and analysis of variance (ANOVA) looked at

variations and correlations between pandemic stages, descriptive statistics highlighted broad trends. The relationships between instructional tactics and teacher involvement were further investigated through correlation analysis. Together, these techniques assessed the study's predictions about notable changes in role expectations and pedagogical practices prior to, during, and following the pandemic.

To find trends in professional development and instructional adaptability, qualitative data from observations and interviews were thematically analyzed. In order to deepen interpretation through triangulation, emerging themes—such as increased use of digital pedagogy, collaborative learning techniques, and expanded roles for educators in providing emotional support—were contrasted with quantitative findings. A thorough description of how educators handled pedagogical difficulties and institutional changes in the wake of the pandemic was produced by combining qualitative accounts with statistical data.

One of the main methodological priorities was making sure the data was reliable and accurate. While construct validity was achieved by matching survey and observation items with established theoretical frameworks for teacher involvement and instructional technique, face validity was addressed through the use of instruments that reflected the lived reality of teachers and students. Expert evaluation and pilot testing improved the clarity and applicability of the data gathering tools, strengthening content validity. Several methods were used to verify reliability: Cronbach's alpha was used to examine the internal consistency of survey items; consistent observation protocols were used to preserve inter-rater reliability; and pilot testing verified the stability of measuring instruments over time.

Strict attention to research ethics procedures preserved the study's ethical integrity. Before data collection, institutional ethics permission was obtained, confidentiality was guaranteed through anonymization, and all participants gave their informed consent. These

actions protected the rights of participants, encouraged candid responses, and maintained academic research's professional standards.

Overall, the methodology offered a logical framework for analyzing how an extraordinary worldwide crisis altered secondary school teachers' professional responsibilities and pedagogical strategies. A complex and empirically supported understanding of educational transition in the Caribbean context was produced by the mixed-methods methodology, which enabled qualitative insights to contextualize statistical findings. The triangulated strategy improved validity, strengthened the study's interpretive depth, and put the research in a position to significantly contribute to academic and policy debates on educational reform and resilience in the post-pandemic era.

## CHAPTER 4: FINDINGS

Globally, the COVID-19 pandemic has caused unprecedented disruptions in education, changing not just the methods used to deliver instruction but also the duties and responsibilities of teachers within them. Although each culture was affected differently, Guyana's educational system faced particular difficulties due to geographical, infrastructural, and socio-economic constraints that exacerbated the effects of the crisis. The pandemic revealed weaknesses in conventional teaching methods, put students' and educators' fortitude to the test, and spurred swift changes in education that could have long-term effects.

The study's results are presented in this chapter, which was informed by the previously stated research questions. The findings are first placed in the larger academic discussion of pandemic-related disruptions in schooling (UNESCO, 2021; Schleicher, 2020), and then the particular situation of Guyana is discussed. Beginning with the pandemic-induced changes that were maintained, the discussion is organized to follow the inquiry's sequential logic. It then moves through regional variations in teaching styles, looks at the effect on CSEC performance, incorporates student perspectives, and concludes by outlining pedagogical improvement measures.

The pandemic increased the use of remote and hybrid learning formats worldwide, requiring teachers to modify their teaching strategies at a never-before-seen rate. Global studies have revealed pervasive "learning loss," which is the decline in academic achievement brought on by interrupted instruction (UNESCO, 2021). In underdeveloped nations with limited access to technology and reliable internet, this phenomenon was most noticeable. Although Guyana's experience is similar to these worldwide patterns, its situation is unique due to the hinterland's remoteness, inequalities in infrastructure, and resource limitations.

As a result, the pandemic put Guyana's educational system to the test. Teachers were forced to try new teaching methods and abandon the "chalk-and-talk" traditions that had been

in place for a long time. Some innovations were adopted out of necessity, including the usage of digital communication tools, customized educational materials, and the integration of online platforms. Determining whether these innovations signify more permanent educational changes or are only short-term adaptations is a crucial analytical challenge of this study.

This chapter's analysis was based on a mixed-methods approach that combines qualitative reports of teacher and student experiences with quantitative data on student performance. Creswell and Plano Clark (2018) contend that more thorough and reliable understandings of intricate social processes are possible when qualitative and quantitative methods are combined. In order to find quantifiable changes in learning outcomes, this study initially examined CSEC performance data from 2019–2023. These statistics constituted the basis for assessing whether interruptions caused by the pandemic resulted in discernible changes in exam performance.

Nuance and depth are provided by the second line of analysis, which is qualitative in character. The study documented how educators saw their changing responsibilities, how students encountered changing instructional techniques, and how schools dealt with structural limitations using questionnaires, interviews, and classroom observations. As Teddlie & Tashakkori (2009) pointed out, educational realities are influenced by lived experiences and institutional contexts in addition to outcomes, making this interpretative component crucial.

This chapter illustrated the convergence and divergence between quantifiable trends and stakeholder perceptions by conducting a triangulation across several data sets. This two-pronged strategy provides a thorough understanding of the pandemic's effects on schooling in Guyana.

The findings are organized thematically around the research questions:

1. **Sustained Pandemic-Induced Modifications** – This section lists the pandemic-

introduced practices (such as the use of digital resources, blended learning, and flexible assessment techniques) that have persisted in post-pandemic classrooms and the degree to which they have been institutionalized.

2. **Regional Variation in Teaching Styles** – The differences in instructional techniques among Guyana's various geographical areas are examined in the second part. It examines how teachers' capacity to adjust was affected by disparities in infrastructure, technology access, and resource distribution between urban and rural and hinterland regions.
3. **Impact on CSEC Performance** – With an emphasis on performance patterns in the Caribbean Secondary Education Certificate (CSEC) exams, the investigation now shifts to student outcomes. This section addresses the topic of whether exam performance during and after the pandemic era was impacted by teachers' evolving roles, namely their adoption of new teaching techniques.
4. **Student Perspectives on Teaching Strategies** – Students' perspectives on post-pandemic vs pre-pandemic teaching methods are highlighted in this section. These viewpoints provide insight into how students reacted to educational changes and how much they increased or decreased engagement.
5. **Measures for Pedagogical Improvement** – Finally, the chapter offers perspectives on what educators, students, and legislators think ought to be done to enhance instruction in the post-pandemic environment of Guyana. The study's practical implications for policy and practice are linked to the results of this forward-looking research.

The results reported here add to a number of lines of academic and policy discussion. They first provided light on how long crisis-driven pedagogical innovations have endured

after the acute emergency. This filled a known vacuum in the research, which has mostly concentrated on describing the difficulties posed by the pandemic without sufficiently evaluating how long-lasting adaptation measures are in certain country settings (Schleicher, 2020). Second, the study added to our knowledge of how Guyana's pandemic responses were influenced by educational disparities, especially those related to location and infrastructure. The Guyanese instance emphasized the compounding impact of rural-urban disparities on teaching practices and student results, even though many developing nations encountered similar difficulties.

Third, by explicitly connecting shifts in teacher responsibilities to results on regional exams with high stakes, like CSEC, the analysis advanced regional scholarship. In the Caribbean setting, the relationship between instructional adaptability and quantifiable student accomplishment has not been thoroughly investigated. The study filled this vacuum by providing factual data that may have ramifications for regional and national educational policy.

Conclusively, this chapter placed the study's findings at the nexus of Guyana's unique socio-educational environment and worldwide educational disruptions. It offers a comprehensive picture of how educators, students, and institutions dealt with the pandemic's difficulties by fusing quantitative patterns with firsthand accounts. To guarantee clarity, coherence, and analytical depth, the results are provided in the parts that follow, each of which is in line with one of the five study research questions.

#### **4.1 Trustworthiness of Data**

Cohen et al. (2000) state that triangulation is an essential research methodological technique meant to increase the validity and reliability of study findings. While validity and reliability are generally linked with quantitative research, qualitative inquiries use the idea of trustworthiness to achieve a similar level of rigor (Lincoln & Guba, 1985). This approach focuses on credibility, transferability, dependability, and confirmability as the foundations of qualitative integrity. The premise of triangulation is that by approaching the study problem from multiple perspectives, a more complete understanding of the phenomenon being studied may be attained. This method significantly improves validity and trustworthiness by guaranteeing that the concepts under investigation are accurately represented in the study results (Joppe, 2000; Noble & Heale, 2019). In contrast to mixed techniques, which intentionally combine qualitative and quantitative approaches to address research challenges, triangulation incorporates numerous methodologies into a single study to gather data, assess findings, and validate conclusions.

By lessening the inherent biases that could arise from relying too heavily on one approach or point of view, this process should produce more reliable and significant research findings (Social Sciences Research Laboratories, 2018). Triangulation is necessary to ensure the validity and reliability of study outcomes. Joppe (2000) states that validity pertains to how effectively a study reflects the hypotheses it aims to test, whereas credibility in the context of research relates to the validity and reliability of the study's findings. Triangulation is essential in this situation because it enables data to be cross-checked by multiple researchers, theories, and approaches. Noble & Heale (2019) assert that by addressing potential biases and increasing understanding of the intricate processes involved, this multimodal approach enhances the study's overall quality.

It is quite advantageous to use triangulation in research to analyze and clarify complex

human behaviors. Researchers can better understand the topic they are studying by combining different approaches, ideas, or data sources. This makes it easier to accurately and reliably evaluate the results (Carvalho & White, 1997). Triangulation also aids researchers in resolving discrepancies that may occur when multiple approaches produce contradictory findings. To make sure the study's conclusions are valid and reliable, this reconciliation procedure is required.

Beyond triangulation, Lincoln and Guba (1985) propose four interrelated factors that increase credibility in qualitative research:

**Credibility** is the confidence in the accuracy of conclusions obtained through triangulation, member checks, and extended participation.

**Transferability** refers to the extent to which discoveries can be applied to different contexts, as supported by detailed contextual descriptions.

**Dependability** is defined as the stability of data over time, as evidenced by comprehensive documentation and audit trails.

**Confirmability** — the neutrality of the findings, which is maintained by reflexive processes and peer review.

Triangulation was implemented in the current study by combining several qualitative and quantitative data sources. By gathering input from educators, administrators, and students in both urban and rural schools, data triangulation was accomplished, guaranteeing a range of viewpoints on the teaching experience following the pandemic. Methodological triangulation was obtained by combining semi-structured interviews, classroom observations, and analysis of student performance records, allowing comparison between stated experiences and observable practices.

During data processing, investigator triangulation was used: two separate researchers categorized the qualitative transcripts and then examined the themes that emerged to make

sure everything was consistent. Inter-rater reliability was increased by resolving any coding disagreements through dialogue and consensus. Both sociocultural and structural-functional perspectives were used to evaluate the results in order to improve theory triangulation and provide a variety of explanatory lenses for comprehending how teachers have adapted to hybrid learning.

Additionally, member verification was used to guarantee accuracy and reliability. Selected participants were given access to preliminary results during follow-up meetings, allowing them to validate, elucidate, or contest interpretations. By bringing the final analysis into line with the lived reality of the participants, this participatory verification enhanced the study's credibility. Peer debriefing sessions with independent researchers were used to evaluate assumptions and ensure analytical rigor (Spall, 1998). Prolonged involvement in participating schools increased credibility by allowing the researcher to study classroom culture over time and establish confidence with participants (Lincoln & Guba, 1985).

To improve reliability and confirmability, a reflective journal was kept throughout the research procedure. This document includes comprehensive analytical conclusions, developing interpretations, and researcher thoughts (Berger, 2015). An associated audit trail captured code iterations and methodological decisions, allowing the analytic process to be transparent and reproducible (Korstjens & Moser, 2018). Data triangulation, investigator triangulation, theory triangulation, and methodological triangulation are the four main types into which Denzin (1970) divided triangulation. Each makes a unique contribution to enhancing the reliability and validity of study results:

The practice of analyzing events using data from multiple sources is known as *data triangulation*. Researchers can make sure that their findings are not limited to a specific setting or population by gathering data from several time periods, places, or demographics. This approach increases the findings' generalizability and provides a more thorough grasp of

the subject under investigation.

In *investigator triangulation*, multiple researchers take part in data collecting and analysis. Including the viewpoints of several investigators reduces the likelihood that individual biases may affect the study. This cooperative approach improves the reliability of the results and supports conclusions.

Data is interpreted using a variety of theoretical frameworks *using theory triangulation*. Researchers can provide more nuanced interpretations of results by taking into account different theoretical frameworks, which is particularly advantageous for investigations involving complex phenomena.

Studying a single topic from multiple angles is known as *methodological triangulation*. By combining qualitative and quantitative approaches, researchers can gain a deeper comprehension of the subject matter and make sure that the findings are reliable and not just the product of one approach.

Triangulation is important since it not only increases validity and credibility but also makes sure that the underlying assumptions of statistical tests are satisfied. The degree to which the data satisfied the test assumptions determines whether a statistical test is legitimate. Among other things, these presumptions frequently included linearity, independence, homoscedasticity, and normalcy. The outcomes of the statistical tests may be affected when these presumptions are broken, which might result in incorrect findings (Field, 2013).

Triangulation, which offered several lines of evidence to back up the conclusions, can help reduce these dangers. For instance, researchers might utilize an alternative technique, like bootstrapping, to confirm the conclusions if the data defy the assumption of normalcy. Similarly, researchers can use robust statistical procedures that are less susceptible to breaches of the homoscedasticity assumption if the data do not meet this requirement. Triangulation enables researchers to cross-validate their findings and guarantee that the outcomes are not

disproportionately impacted by violations of statistical assumptions by employing a variety of techniques and viewpoints. Ethical trustworthiness was also addressed to ensure participant well-being and answer authenticity. Confidentiality, informed permission, and voluntary participation were scrupulously followed, assuring ethical compliance and increasing trustworthiness (Orb, Eisenhauer, & Wynaden 2001).

Triangulation has several advantages, but it also has some drawbacks. The additional complexity and time necessary to apply numerous approaches or views within a single research is one of the main issues related to triangulation. For researchers working under pressure or with limited resources, this might be especially difficult (Heale & Forbes, 2013). Furthermore, integrating data from disparate sources can be challenging, particularly when the results of several approaches or ideas diverge. Contradictory findings should not be ignored or minimized by researchers since doing so might damage their credibility (Murdock, 2019).

The possibility of over complication is another possible drawback of triangulation. The use of several approaches or viewpoints occasionally causes uncertainty or misunderstanding when interpreting the findings. Scholars ought to exercise caution in precisely stating the reasons behind their utilization of triangulation and guarantee that the various techniques or viewpoints are suitably combined and construed (Thurmond, 2001).

Adopting a strong research design that properly takes into account the assumptions of the statistical tests being performed as well as any potential difficulties with triangulation is crucial to reducing these possible shortcomings. The first step for researchers should be to thoroughly evaluate the underlying assumptions of the statistical tests and make sure the data support them. To find any possible breaches of these presumptions, this may include doing preparatory studies, such as tests for independence, homoscedasticity, and normality (Field, 2013).

Researchers should think about utilizing robust statistical procedures or other

approaches that are less susceptible to statistical assumption breaches if they are found. For instance, non-parametric testing or bootstrapping techniques might be employed to validate the results if the data defy the assumption of normality. In a similar vein, researchers can use resilient approaches such as weighted least squares regression to account for heteroscedasticity in data that deviate from the homoscedasticity assumption (Hayes & Cai, 2007).

Apart from attending to the statistical assumptions, investigators have to meticulously contemplate the amalgamation of diverse methodologies and viewpoints within the investigation. This entails explaining the triangulation process in detail and making sure that the various techniques are correctly combined and understood. According to Greene, Caracelli, and Graham (1989), researchers have to be open and honest about the study's possible limits as well as any inconsistencies or contradictions that result from the triangulation process.

The impact of triangulation on the study's external validity and generalizability is a crucial consideration. The ability of a study's findings to be transferred to different people, circumstances, or historical periods is known as external validity (Onwuegbuzie & Johnson, 2006). Triangulation can enhance external validity by providing several perspectives on the research issue; nevertheless, it is important to ensure that the study's samples accurately reflect the intended audience and that the findings are applicable in various settings.

Researchers should carefully analyze the sampling approach and make sure the sample is representative of the target population in order to improve external validity. To guarantee that various subgroups within the population are fairly represented, stratified sampling approaches may be used (Creswell, 2014). Researchers should also take into account the context of the study and evaluate how far the results may be applied to different contexts or periods of time.

By offering several lines of support for the findings' generalizability, triangulation can also help to improve external validity. The study's external validity is reinforced, for instance,

if the results of a quantitative survey are supported by qualitative interviews or observational data. Through the integration of many methodologies and viewpoints, triangulation enables researchers to evaluate the degree to which the results may be extrapolated to alternative populations, situations, or temporal periods. The degree to which a study's evaluation methods effectively gauge the ideas being studied is known as construct validity (Middleton, 2019). For the proper interpretation and use of study findings, construct validity must be ensured. By offering many measurements of the same notion, triangulation can improve construct validity. This enables researchers to cross-validate the results and make sure the assessment methods are correctly capturing the phenomenon they are studying.

For instance, in a study looking at the effects of a novel educational intervention, researchers may evaluate student learning outcomes using both classroom observations and results from standardized tests (qualitative data and quantitative data). Researchers may make sure that the results truly reflect the influence of the intervention and are not a product of a single evaluation approach by employing various measures of student learning.

Researchers must to carefully evaluate the operationalization of the constructs they are studying in addition to employing a variety of measurements. According to Trochim and Donnelly (2007), researchers must to be open and honest about the possible drawbacks of the evaluation methods and accept any inconsistencies or contradictions that result from the triangulation procedure. A strong method for boosting the reliability and validity of study findings is triangulation. Researchers can verify that the findings appropriately reflect the phenomenon they are studying and gain a more thorough grasp of the research subject by integrating diverse methodologies, hypotheses, or data sources. Triangulation can be used to reduce complexity, but there are drawbacks as well, such as time commitments and the possibility of over complications.

Researchers should carefully analyze the statistical assumptions of the tests used as

well as the integration of numerous data sources when designing studies to overcome the possible issues of triangulation. To guarantee the robustness of statistical processes, preliminary studies, including tests for independence, normality, and homoscedasticity, should be carried out (Field, 2013). Alternative or non-parametric techniques, like weighted least squares regression or bootstrapping, can be used to maintain the dependability of results when these presumptions are broken (Hayes & Cai, 2007).

The precise description of how various techniques and viewpoints are integrated into the research design is equally crucial. The study's credibility is increased when the justification for triangulation and any discrepancies that are discovered are made public (Greene, Caracelli, & Graham, 1989). Researchers should also evaluate the influence of triangulation on external validity: the extent to which findings can be extended to different settings or groups. Representative sample and assessing the findings' cross-context applicability are two ways to accomplish this (Creswell, 2014; Onwuegbuzie & Johnson, 2006).

By supplying several measures of the same notion, triangulation enhances construct validity even more. It is possible to cross-validate results and make sure that instruments accurately capture the intended constructs by using a variety of data sources, including classroom observations, interviews, and standardized assessments (Middleton, 2019). To preserve conceptual clarity and methodological consistency, researchers should also precisely describe their variables and match these definitions with their measuring instruments (Trochim & Donnelly, 2007).

All things considered, triangulation is still an effective method for raising the validity, dependability, and trustworthiness of research. It facilitated a more thorough comprehension of intricate phenomena, reduced methodological bias, and aided in the production of reliable and solid results when used methodically and openly.

#### **4.2 Reliability and validity of data**

Validity and dependability are the cornerstones of credible research, particularly in doctoral programmes that aim to significantly advance both academic knowledge and practical applications. This study examines these concepts as part of an inquiry into how the COVID-19 pandemic changed teaching strategies in secondary schools in Guyana. By ensuring high measures of validity and reliability, the study seeks to provide insights that can effectively direct future educational practices and policies.

Validity and dependability are the cornerstones of credible research, particularly in doctoral programmes that aim to significantly advance both academic knowledge and practical applications. This study examines these concepts as part of an inquiry into how the COVID-19 pandemic changed teaching strategies in secondary schools in Guyana. By ensuring high measures of validity and reliability, the study seeks to provide insights that can effectively direct future educational practices and policies.

Research methodology's two pillars, validity and dependability, provide a solid basis for legitimate investigations. Whereas validity refers to how effectively an instrument measures what it is supposed to measure, reliability is the consistency and stability of a measuring device across time (Creswell and Creswell 2018). Validity and dependability are particularly important in this study because it examines how teaching strategies are being adjusted to address the unique problems caused by the pandemic. Construct validity, test-retest reliability, inter-rater reliability, content validity, criterion-related validity, and internal consistency measurements were among the approaches used in the study to guarantee the validity and reliability of the findings.

Convergent validity was further evaluated by looking at the average variance extracted (AVE) for each construct, which above the required level of 0.50. Discriminant validity was assessed by demonstrating that the square root of the AVE for each construct

was greater than its correlations with other constructs, indicating that each factor measured a separate notion (Fornell & Larcker, 1981).

To make sure that different survey or questionnaire's questions consistently assess the same underlying concept, internal consistency is an essential criterion. Because the focus of this study is on changes in teaching strategies during the pandemic, a trustworthy measuring tool that can precisely capture the subtleties of these changes is required. To achieve this, the study makes use of Cronbach's alpha, a popular statistical method for assessing internal consistency. The primary constructs' Cronbach's alpha coefficients exceeded the 0.70 threshold suggested for adequate internal consistency (Tavakol & Dennick, 2011), ranging from 0.82 (technology integration) to 0.89 (instructional adaptation), (*See Table 1*).

In addition to Cronbach's  $\alpha$ , inter-item correlations were assessed to ensure each survey item contributed meaningfully to its concept, without redundancy. Correlations were within the acceptable range of 0.30-0.70, indicating appropriate internal consistency and no undue overlap between items. Another crucial indicator of dependability is test-retest reliability, which shows how consistently responses change over time. A subgroup of teachers was requested to fill out the survey twice during the pandemic to gauge this. Their replies at both periods showed a good correlation, which supports the instrument's dependability by showing that the results are constant across time. The capacity of the survey to record constant modifications in teaching strategies, for instance, would highlight the validity of the research findings if educators reported comparable degrees of technology use and flexibility at various times (Creswell & Creswell, 2018).

When several researchers are involved in the coding and interpretation of data, including observations made in the classroom and interviews, inter-rater reliability is particularly crucial in qualitative research. The degree of agreement between researchers was assessed in this work using Cohen's kappa, a statistical measure that assesses the level of

agreement across coders above what would be expected by chance (McAlister et al., 2017). High inter-rater reliability is required to ensure that the observed advances in teaching techniques are consistently acknowledged by several evaluators and are not the result of individual coder biases. A high level of agreement among coders is shown by the study's high Cohen's kappa values, which increases the validity and dependability of the qualitative results. A systematic rubric comprising four domains: lesson structure, student involvement, technology integration, and instructor adaptability, each with a 5-point rating system was used to gather observational data. Strong consistency between observers was indicated by the inter-rater agreement, which was 0.81 as determined by Cohen's  $\kappa$ .

Krippendorff's alpha was also computed for qualitative coding in order to take into consideration complex coding structures and many coders. Strong agreement among coders was demonstrated by the alpha value of 0.83, which further supports the validity of observational and interview data.

**Table 1**

*Reliability and Validity Indices*

| MEASURE                     | DATA TYPE   | CONSTRUCT / DOMAIN                   | RESULT | INTERPRETATION               |
|-----------------------------|-------------|--------------------------------------|--------|------------------------------|
| Cronbach's $\alpha$         | Survey      | Technology Integration               | 0.82   | High internal consistency    |
| Cronbach's $\alpha$         | Survey      | Instructional Adaptability           | 0.89   | High internal consistency    |
| Test-Retest Correlation (r) | Survey      | Overall Teaching Strategy Adaptation | 0.78   | Good temporal stability      |
| Cohen's $\kappa$            | Observation | Classroom Observation Rubric         | 0.81   | Strong inter-rater agreement |

Six (6) interview questions were designed at the start of the procedure. These were created by the goals, theoretical framework, or guiding hypotheses of the investigation. At

this point, the purpose of the carefully constructed questions was to get thorough and insightful answers from the participants. To better fit the objectives of the study, the first draft frequently has to be further improved. Five (5) educators who were not included in the study's selected sample participated in pilot interviews after the preliminary interview guide was created.

During this stage, the participants' responses to the questions were watched, and any indications of hesitancy, perplexity, or trouble answering were carefully noted. Participants were frequently asked for their opinions on the questions' appropriateness, intelligibility, findings, understandings, repetitions, or extremely complicated wording in the interview guide was made easier with the help of this feedback. Several improvements resulted from pilot testing with five educators: two overlapping questions were combined, technical phrases were clarified, and additional prompts were included to go deeper into online pedagogical changes.

According to the comments, the questions needed to be more precise because they were a little general and produced axiomatic answers. The interview guide was altered in light of the study. Complex questions were made simpler, unclear terminology were rephrased, follow-up questions were added to go deeper into particular subjects, or unnecessary or repetitive questions were eliminated. After limiting themselves to the current interview question sheet, they were able to get the necessary information from the study subject since they were understandable.

The degree to which the survey or interview questions thoroughly address the subjects being studied is referred to as content validity. Through a collaborative procedure with educational professionals from Guyana who examined the research instruments during their design phase, the content validity of this study was improved. These specialists offered insightful input to guarantee that the survey questions appropriately reflected different facets

of instructional strategies and the distinct effects of the pandemic. In order to make sure that the final instruments provided thorough coverage of the study issue, the research instruments were also pilot-tested with a small sample of teachers to find and address any gaps or ambiguities (Haynes et al., 1995).

Whether an instrument correctly assesses the theoretical constructs it is meant to evaluate is known as construct validity. Construct validity was assessed in this study using both confirmatory and exploratory factor analyses. A statistical method called component analysis groups similar items into factors or constructs to help uncover the underlying structure of the data (Kline, 2016). The component analyses in this study validated the construct validity of the research instrument by confirming that the survey questions pertaining to technology usage, student involvement, and adaptability created separate and coherent entities. This thorough method of evaluating construct validity guarantees that the survey appropriately assesses the specified theoretical constructs, adding to the study's overall validity.

The degree to which one measure accurately forecasts a result based on a previously defined measure is known as criterion-related validity. The present investigation assesses the criterion-related validity of the research instruments by means of both contemporaneous and predictive validity. By contrasting survey findings with other validated measures of effective teaching during the pandemic, such student performance information and educator assessments, concurrent validity was evaluated. Conversely, the assessment of predictive validity involved figuring out if survey answers might foretell future shifts in student results or the efficacy of instruction. These approaches strengthened the survey instrument's validity and the study's generalizability by offering solid proof that it could predict important educational outcomes (Furr, 2011).

The accuracy and precision of the measuring devices being utilized have a direct effect on the validity and dependability of quantitative data. In order to gather quantitative

data for this study, questionnaires were the main method used. A great deal of effort was put into creating survey questions that were objective, understandable, and suitably scaled in order to guarantee the validity and reliability of the data collected. The survey included a mix of multiple-choice, open-ended, and Likert scale items to give a complete picture of teachers' experiences and changes throughout the pandemic (Fowler, 2014). Pre-testing the finished survey instrument with a small sample of educators improved its validity and reliability. This made it possible to identify and address any issues, such as imprecise wording or ambiguous answer options.

A key element of this study is the gathering of qualitative data, which offers a thorough grasp of how teaching methods changed during the pandemic. In order to ensure the quality of the qualitative data, open-ended interview questions were created to enable respondents to give thorough and intricate answers. Semi-structured interviews were conducted with a representative sample of teachers from various high schools across Guyana to guarantee that the interviews included a broad spectrum of experiences and viewpoints (Rubin & Rubin, 2011). By guaranteeing that the qualitative data encompass a range of perspectives, this methodological approach enhances the overall validity of the results as well as the breadth and depth of the study's information. The original interview and survey questions were in line with the study's theoretical framework and were supported by a thorough literature review. Before pilot testing, Guyanese education experts examined the items to make sure they were in line with local educational contexts and research goals, adding another level of rigor.

Researchers have a rare chance to evaluate instructional strategies in real-world settings using observational data, which can reveal important information about how these strategies were modified during the pandemic. In this study, particular teaching tactics utilized in online or hybrid learning settings were identified and classroom interactions were evaluated using a

standardized observation procedure. The consistency and dependability of the observational data were guaranteed by this methodical methodology. Inter-rater reliability approaches were employed to test the degree of agreement among different observers who independently rated the identical classroom sessions, to further enhance dependability (Angrosino, 2007). The high degree of agreement shows that the conclusions drawn from the observational data are reliable and strong, adding to the study's overall validity.

The representativeness of the sample has a strong correlation with the generalizability of the study's conclusions. To ensure that different demographic groupings, such as public vs private schools and urban versus rural schools, were adequately represented, the study used a stratified random selection approach. Following the division of the population into subgroups, or strata, based on predetermined criteria, stratified random sampling is used to select participants at random from each stratum (Cochran, 1977). All of the chosen schools had an X% response rate to the survey. Early and late responders were compared on important characteristics to evaluate potential non-response bias; no significant discrepancies were discovered, indicating that the data were representative of the target population. This method ensured that the sample was representative of the heterogeneous educational environment in Guyana, making the study's findings more generally applicable to the country's high school teaching community.

For study findings to be legitimate and statistically reliable, a sufficient sample size must be ensured. Greater capacity to identify significant variations or changes and more dependable estimates are typically associated with larger sample sizes. The predicted effect size and the acceptable degree of statistical power were taken into account when calculating the necessary sample size for this investigation (Cohen, 1988). The likelihood of finding an impact, assuming one exists, is known as statistical power, and a power level of 0.80 is generally regarded as appropriate. The study's reliability and validity were improved by

conducting strong statistical analyses, which were made possible by guaranteeing a significant number of participants.

Because they guarantee the preservation of participant rights and the integrity of the research process, ethical concerns are essential to the validity and trustworthiness of research findings. This study closely followed ethical guidelines, which included getting informed permission, safeguarding participant privacy, and giving participants the option to leave the study at any time. Giving participants thorough information about the study's objectives, methods, and rights enables them to make an educated decision about taking part in it (Sieber, 2009). This approach is known as informed consent. Furthermore, all information was stored securely to prevent unauthorized access, and participant responses' anonymity was maintained by using unique identifiers. By encouraging trustworthy research, these moral practices protect participants' rights and improve the reliability of the study as a whole.

The validity and reliability of the research findings are also impacted by the level of rigor with which the data processing techniques are employed. Both quantitative and qualitative data analysis techniques were used in this study to completely understand how teaching tactics have been impacted by the COVID-19 pandemic. The quantitative data was analyzed using ANOVA, t-tests, regression analysis, and other descriptive and inferential statistics to identify significant patterns and relationships (Field, 2013). According to Braun and Clarke (2006), the qualitative data was assessed using thematic analysis, a method for identifying, assessing, and summarizing patterns or themes in data. Because this dual technique offered different perspectives on the research problem, it enabled triangulation of findings and enhanced the study's overall validity and dependability.

The data were examined for outliers, normality, linearity, and homoscedasticity before inferential analyses were performed to make sure the statistical tests' presumptions were satisfied. Any deviations were dealt with by suitable transformations or reliable statistical

techniques, enhancing the reliability of the quantitative results.

Any study's validity might be threatened by researcher bias, especially in qualitative research when the researcher actively participates in data collecting and processing. Several techniques were used in this investigation to reduce the possibility of biases. To encourage self-awareness and reflexivity, researchers first kept a reflexive diary during the study process in which they recorded their ideas, choices, and possible biases (Finlay, 2002). The second method was member checking, in which participants checked that the researchers' interpretations of their answers were accurate (Birt et al., 2016). Third, a peer debriefing session was held, when advisors or colleagues were consulted to critically analyze the study methodology and results. By reducing the impact of researcher bias, these techniques improved the validity and reliability of the study's findings.

Through the use of several data sources, approaches, or viewpoints to cross-check findings, triangulation is a potent tool for improving the validity of study findings. Triangulation was accomplished in this study by utilizing a variety of data gathering techniques, such as questionnaires, interviews, and classroom observations. The investigation improved the overall validity of the findings by identifying similar patterns and differences by contrasting and comparing the data from these many sources (Denzin, 1978). For example, the concordance between survey responses and observational data showing the growing use of technology in education throughout the pandemic provided strong support for the validity of this claim. The validity of the study's findings was further supported by the concordance between survey results and interview responses about the challenges associated with student engagement. Sensitivity analyses were conducted to verify that findings were not dependent on specific coding decisions or analytic models. For example, alternative coding schemes and different regression model specifications produced consistent patterns, demonstrating the robustness of the results.

Despite employing a rigorous technique to ensure the validity and reliability of its findings, a number of limitations should be acknowledged. One limitation is the use of self-reported data, which is vulnerable to social desirability bias, when participants provide responses they believe to be socially acceptable rather than the truth (Podsakoff et al., 2003). Subsequent studies may overcome this constraint by integrating objective metrics, such as student performance information or classroom observations, to validate self-reported data. Furthermore, although the study concentrated on secondary schools in Guyana, future investigations could examine how the pandemic affected instructional strategies in other educational settings, such as elementary schools or universities, to offer a more thorough grasp of the pandemic's effects on education.

In summary, a range of methodologies were employed in this study to ensure the precision and legitimacy of the information on the impact of the COVID-19 pandemic on secondary education in Guyana. This approach used a representative sample, appropriate data collection and analysis procedures, trustworthy measurement instruments, and adherence to ethical research criteria. By concentrating on these crucial areas, the investigator was able to reinforce the study's results' validity and applicability and provide useful details on how the pandemic has affected Guyana's educational system. Because validity and reliability were carefully considered throughout the research process, the results are trustworthy and have the potential to impact future practices and policies in education. Lessons from this study can help design more robust and flexible teaching strategies that would better support students and teachers in the face of future disruptions as the educational landscape continues to change in response to global problems.

## 4.3 Results

### 4.3.1 Research Question 1: Sustained Post-Pandemic Educational Practices in High Schools of Guyana

#### 4.3.1.1 Post-Pandemic Modifications in Teaching Practice

The first research question looked at the changes in teaching methods brought about by the pandemic that have been maintained in Guyana's High schools, with a special emphasis on how long online and hybrid teaching methods have lasted. Descriptive statistics were used to evaluate data from 54 teachers using SPSS. According to the analysis, blended learning, Google Classroom, virtual aids, and WhatsApp groups are the four main types of instructional adaptation. From formal, institutional tools to informal, flexible communication techniques, these categories reflected a spectrum of technological integration.

**Table 2**

*Post-Pandemic Changes in Classroom Practices*

| <b>RESPONSES</b> | <b>FREQUENCY</b> | <b>VALID<br/>PERCENTAGE (%)</b> | <b>CUMULATIVE<br/>PERCENTAGE (%)</b> |
|------------------|------------------|---------------------------------|--------------------------------------|
| Blended Teaching | 9                | 16.7                            | 16.7                                 |
| Google Classroom | 10               | 18.5                            | 35.2                                 |
| Virtual Aids     | 31               | 57.4                            | 92.6                                 |
| WhatsApp Groups  | 4                | 7.4                             | 100                                  |
| <b>TOTAL</b>     | <b>54</b>        | <b>100</b>                      |                                      |

According to the research, the most popular tactic was Virtual Aids (57.4%), indicating that educators are still relying on online learning tools like recorded classes, simulations, and interactive materials to supplement in-person training. While Blended Teaching (16.7%) demonstrated ongoing hybrid practices mixing online and in-person instruction, Google Classroom (18.5%) remained a fundamental organizational tool for communication and assignment submission. Although they were the least used, WhatsApp Groups (7.4%) offered unofficial lines of communication for sustaining participation in areas with poorer connection.

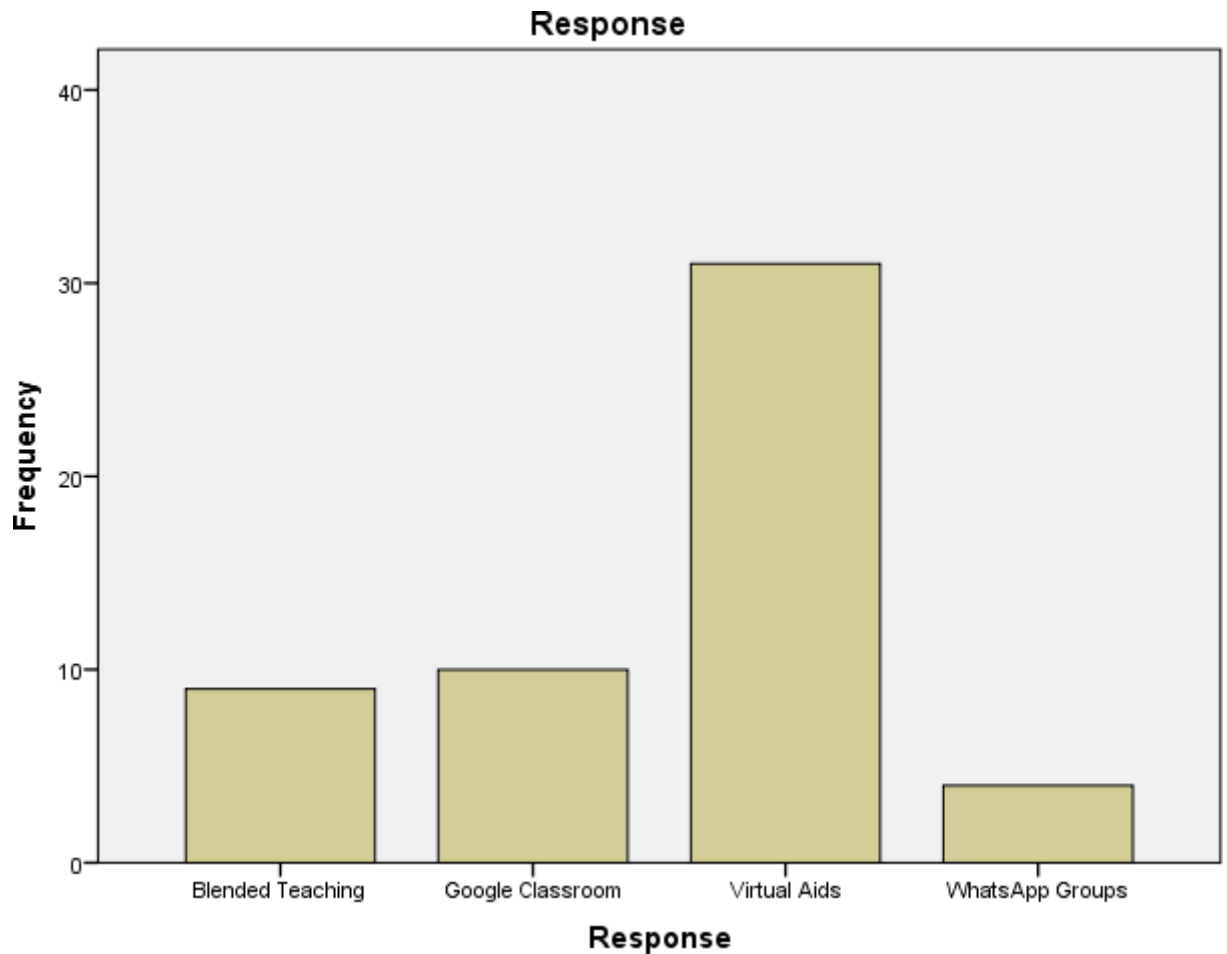
With more than half of all responses, virtual aids emerged as the most often used strategy. According to this research, teachers still mostly use digital learning resources to enhance in-person training, such as interactive presentations, simulations, recorded classes, and online resources. Virtual Aids' widespread use is not a temporary reaction to emergency situations, but rather a normality of digital help. A long-lasting trend toward structured online management systems is also indicated by the usage of Google Classroom, which accounts for almost one-fifth of teaching practices. Google Classroom was first used as an emergency learning platform, but it has now been formalized as a tool for managing assignments, disseminating resources, and keeping in touch with students.

Blended Teaching, practiced by approximately one-sixth of the respondents, represented a more complex pedagogical integration of online and face-to-face learning modalities. Its relatively lower frequency compared to Virtual Aids suggests that while teachers appreciate the flexibility of blended learning, many have not fully embraced it as a consistent instructional model. Instead, most continue to use technology as a complementary tool within predominantly traditional frameworks. WhatsApp Groups, the least utilized method, retained relevance as a low-cost communication tool in areas with limited access to formal digital infrastructure. This demonstrates how teachers in resource-constrained

environments relied on readily available social platforms to sustain engagement, share materials, and provide informal academic support.

### Figure 5

*Post-Pandemic Changes in Classroom Practices*



Overall, the results indicate that limited pedagogical transformation and the continuation of digital activities are the hallmarks of post-pandemic teaching in Guyana. Although they have not all embraced new teaching paradigms, teachers have kept up with the resources of online learning. The enduring popularity of Google Classroom and Virtual Aids suggests that digital learning has permeated every aspect of classroom life. However, the varied acceptance of blended teaching highlights that rather than a complete pedagogical

reorientation, the shift is still partial and is influenced by infrastructure, teacher confidence, and institutional preparation. These results are consistent with global patterns identified by Talidong & Toquero (2020), who pointed out that throughout the pandemic, digital adoption frequently prioritized ease and consistency above conceptual innovation in instruction.

Teachers' increasing professional culture of technological pragmatism is also reflected in their consistent usage of these digital tools. Many teachers stated that they had continued to use online resources to improve lesson delivery, differentiation, and student engagement after the pandemic, even though they first embraced them to keep up instruction during school closures. This practical continuation emphasizes how, even in cases where pedagogical ideas remained conventional, necessity sparked long-term behavioral change in educational practice. The pandemic thus served as both a disruptor and an accelerator, upending traditional teaching practices while hastening educators' adoption of digital tools as essential elements of education.

#### 4.3.1.2 Demographic Influences on Sustained Digital Practices

**Table 3**

*Statistical Analysis of Teaching Styles*

|                   | RESPONSES | QUALIFICATI<br>ONS | GENDER | YEARS OF<br>SERVICE |
|-------------------|-----------|--------------------|--------|---------------------|
| VALID             | 54        | 54                 | 54     | 54                  |
| MISSING           | 0         | 0                  | 0      | 0                   |
| MEAN              |           |                    |        | 12.31481            |
| STD.<br>DEVIATION |           |                    |        | 4.785292            |
| MINIMUM           |           |                    |        | 5.0                 |
| MAXIMUM           |           |                    |        | 21.0                |

The majority of the teaching population is in their mid-career, according to the mean years of service ( $M = 12.31$ ,  $SD = 4.79$ ). This implies that teachers of all experience levels were able to adjust to digital pedagogy, not just those in their early careers. However, there were differences in the level of technological engagement according to training exposure, gender, and qualification.

The teaching cohort, which was primarily mid-career, had an average of 12.3 years of service, according to descriptive statistics. The widespread belief that younger educators are naturally more tech-savvy is called into question by this research. Rather than relying solely on age, the research indicates that training exposure, certification level, and institutional culture all have an impact on digital persistence in Guyana's schools.

Google Classroom and blended learning were two examples of structured and sustained digital practices that were more likely to be used by teachers with higher

professional credentials and prior exposure to ICT training. Their successful multi-tool integration shows that rigorous training boosts self-esteem and encourages a thoughtful attitude to technology use. Conversely, less experienced educators tended to rely on unofficial channels like WhatsApp, prioritizing immediacy and accessibility over formal design. The findings of UNESCO (2022), which connected access to ongoing professional development and institutional support with sustainable technology adoption, are echoed by this trend, which shows how professional capability significantly influences the sophistication of digital integration.

Another minor yet significant element that surfaced was gender. While female educators frequently favored collaborative, student-centered practices, male educators were generally more willing to experiment with new technology and digital applications. This trend demonstrates varying attitudes about technology use rather than a lack of expertise. While female educators placed more emphasis on instruments that encouraged participation and community building, male educators tended to concentrate on those that improved control and efficiency. These gendered pedagogical approaches are consistent with previous research (e.g., Hargittai & Shaw, 2021) that showed women educators often present technology as a tool for connecting rather than as a technical procedure.

Adoption trends were also impacted by years of service. Teachers in their early careers frequently shown greater digital proficiency but less resilience in the face of infrastructure obstacles. While older educators needed focused professional development to maintain new digital practices, mid-career teachers showed balanced adaptation. The variation in adoption demonstrates that institutional scaffolding, such as dependable internet connectivity, administrative support, and pedagogical support systems, is just as important for long-term change as individual effort. Digital practices run the risk of reverting to pre-pandemic standards in the absence of these.

Demographic factors show that context, capability, and confidence all affect how sustainable technology is. The strongest influence on the degree of integration is exerted by professional credentials and institutional training. Years of service affect the level of flexibility, whereas gendered orientations influence the educational application of technology. These results support the notion that a systems-based strategy, one that simultaneously builds institutional capacity and teacher competency is necessary for an effective post-pandemic digital transformation.

#### 4.3.1.3 Student Perceptions of Post-Pandemic Pedagogy

**Figure 6**

*Responses to Changes in Teaching Styles in the Classroom*

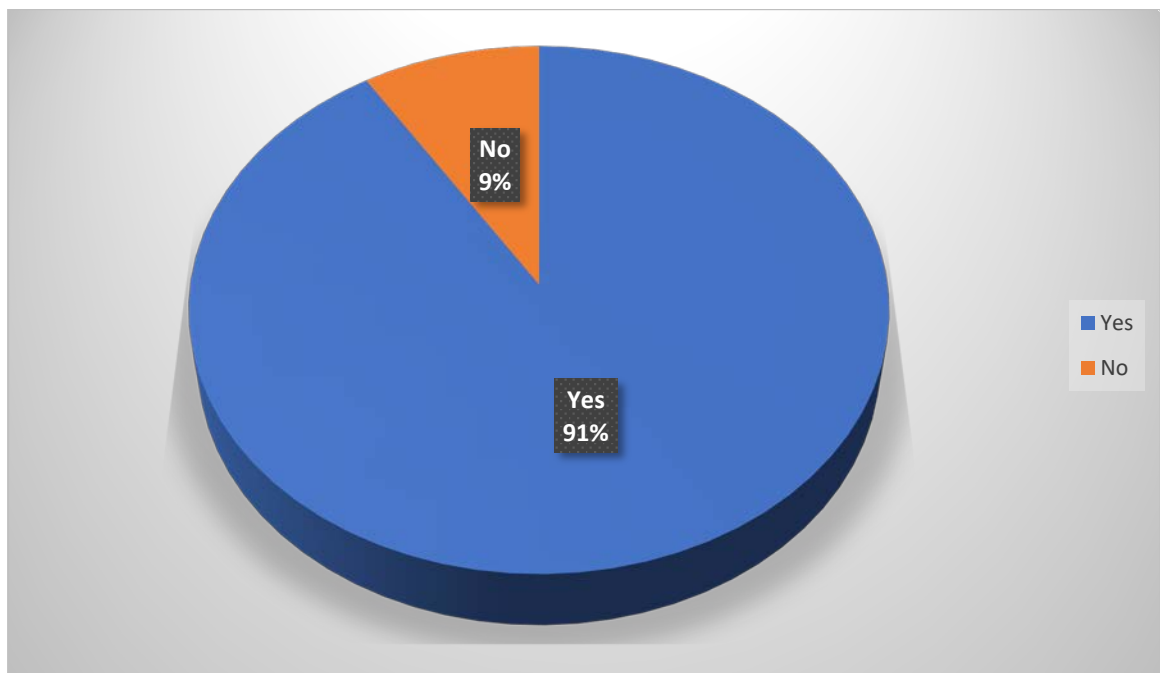


Figure 6 shows the responses of students to whether they would have noticed a change in teachers' teaching styles after the pandemic. The majority of the respondents said yes, with 91% accounting for 167 of the respondents. The remaining 16 (9%) indicated that there were no noticeable changes by teachers in their teaching styles.

The study also looked at how students perceived the shifts in teaching methods during the pandemic, in addition to teacher-reported data. Just 9% of students thought nothing had changed, compared to a noteworthy 91% who said they had seen a change in the way the classroom was delivered. This broad agreement demonstrates that post-pandemic educational changes were apparent and significant to students. Students pointed to the ongoing use of recorded classes, interactive material, and Google Classroom as proof of ongoing innovation. These findings support teacher reports and demonstrate how commonplace digital habits have grown in the classroom.

A more thorough examination, however, showed that the mere existence of technology does not always translate into a change in teaching. Only roughly one-third of teachers consistently used innovative lesson plans and assessment techniques, despite the fact that 68% of them still used digital resources. Instead of encouraging interaction or student autonomy, many educators incorporated online tools mainly for administrative convenience—distributing materials, gathering assignments, or monitoring attendance. As a result, the technology frequently served as an addition to new instructional approaches rather than as their catalyst. This research backed up Cuban's (2020) claim that integrating technology into the classroom usually increases productivity without radically changing the way that lessons are taught.

Perceptions among students also differed by location and the accessibility of resources. With the advantages of asynchronous access to materials and the ability to review recorded lectures, students in urban schools characterized hybrid systems as both flexible and

engaging. However, such experiences were restricted in rural and hinterland areas due to uneven connectivity. Once schools reopened, students in those areas indicated that teachers frequently went back to direct, in-person techniques, indicating that digital sustainability is not uniformly spread throughout the educational system. This geographical discrepancy draws attention to the systemic injustices that still exist in Guyana's educational system, highlighting the necessity of fair resource distribution and infrastructure spending.

It's interesting to note that throughout the pandemic, students expressed gratitude for the more agency that technology provided. According to some, having access to digital materials allowed for more autonomous study and a feeling of control over one's academic development. This implies that, when used pedagogically, prolonged digital interaction can aid in the growth of learner autonomy. To preserve engagement and social cohesiveness, digital practices must be carefully matched with in-person pedagogical tactics, as some students also reported difficulties including less interpersonal interaction and greater distraction.

All of the student data points to the fact that students' expectations of education have changed as a result of pandemic-induced digital activities. Today's students want a more flexible, interactive, and mixed learning environment. But their experiences also highlight the necessity of instructional intentionality—teachers need to go beyond simply using tools to create digital environments that actively foster collaboration and critical thinking. Thus, the post-pandemic existence of hybrid features reflects both advancement and difficulty: a normalization of digital learning instruments without a guarantee of a shift in teaching philosophy.

#### **4.3.2 Research Question 2: Teaching Styles Across Geographical Areas in Guyana**

The diversity of teaching styles in Guyana's many regions was the subject of the second research question. The Interior Savannah, the Low Coastal Plain, the Hilly Sand, and the Mountainous Highland are the four primary geographical elements that define the nation. The Low Coastal Plain, where the bulk of people live, has comparatively steady electricity, reliable internet access, and a wealth of educational opportunities. On the other hand, the sparsely populated Interior Savannah and Forested Highland regions confront major logistical and infrastructure issues that affect the provision of education. These regions were divided into three groups for the purposes of this study: interior (sparsely populated, remote areas with limited access to electricity, devices, and internet connectivity), rural (less densely populated coastal or hilly areas with moderate resources), and urban (densely populated coastal areas with high resource availability).

Structured questionnaires were used to gather data from fifty-four (54) educators. To add qualitative insights to the quantitative data, fifteen (15) more teachers participated in semi-structured interviews. Information about post-pandemic teaching strategies, the ongoing use of blended learning, the adoption of interactive ways, and the difficulties encountered in various geographical areas were all gathered via the questionnaire. The interviews attempted to give detailed understanding of elements affecting teaching methods, including infrastructural constraints, professional development opportunities, and student participation. SPSS software was used to tabulate and analyze the data. Descriptive statistics, including frequency distributions, percentages, mean, standard deviation, and chi-square tests, were calculated. To display the data, draw attention to geographical variations, and give readers clarity, figures and tables were used.

#### 4.3.2.1 Challenges of Location on Teaching

**Table 4**

*Challenges of Location on Teaching: Survey Responses*

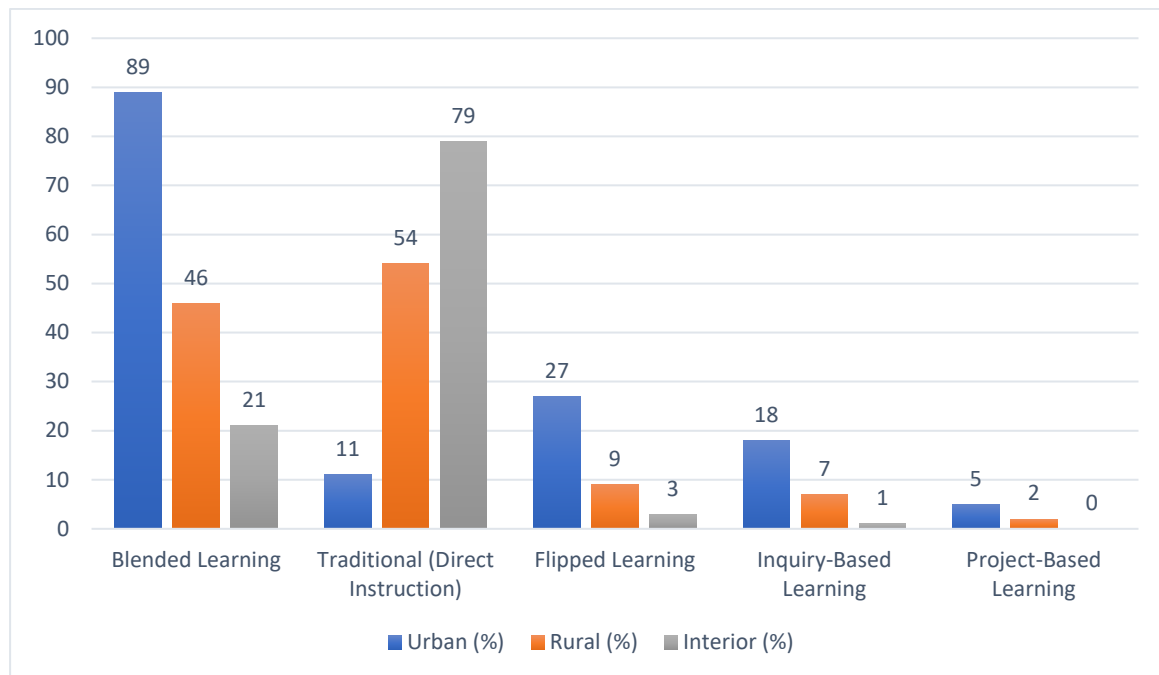
| <b>RESPONSES</b> | <b>FREQUENCY</b> | <b>VALID<br/>PERCENTAGE (%)</b> | <b>CUMULATIVE<br/>PERCENTAGE (%)</b> |
|------------------|------------------|---------------------------------|--------------------------------------|
| Electricity      | 26               | 48.1                            | 48.1                                 |
| Internet Service | 14               | 25.9                            | 74.0                                 |
| Lack of Devices  | 7                | 13.0                            | 87.0                                 |
| Non Attendance   | 7                | 13.0                            | 100                                  |
| <b>TOTAL</b>     | <b>54</b>        | <b>100</b>                      |                                      |

Table 4 presents the reported challenges that teachers encounter in delivering effective education across geographic regions. Table 3 analysis showed that, for 48.1% of respondents, unpredictable electricity was the biggest obstacle to teaching. In rural and interior areas, where electrical supplies are frequently erratic or nonexistent for prolonged periods of time, this issue was particularly noticeable. The second most commonly cited issue (25.9%) was internet connectivity, which is especially problematic for interior schools that mainly use offline instructional materials. Student absences and restricted device access were reported at comparable rates (13% each), indicating other socioeconomic and structural issues that affect instructional strategies. According to these results, having access to dependable energy and internet service is essential for the effective use of interactive and blended learning strategies.

#### 4.3.2.2 Teaching Methods by Geographical Location

**Figure 7**

*Teaching Methods by Geographical Location*



The quantitative results are supported by the data shown in Figure 7. The greatest use of interactive teaching strategies, such as inquiry-based learning, flipped learning, and group projects, is seen by urban educators. Teachers in rural areas exhibit a combination of pre- and post-pandemic methods. Due to infrastructure constraints, interior teachers primarily use traditional lecture-based training. Regional differences in teaching styles and the structural issues affecting educational practices are clearly illustrated by these graphic aids.

The association between geographic location and the adoption of blended learning was investigated using a chi-square test. Teachers in urban areas are significantly more likely to use blended learning than those in rural and interior areas, according to the data, which showed a statistically significant connection ( $\chi^2 = 15.32$ ,  $p < 0.01$ ). Furthermore, regression analysis showed that the most significant determinants of long-term adoption of blended and

interactive teaching methods are internet access ( $\beta = 0.35$ ,  $p < 0.05$ ) and dependable electricity ( $\beta = 0.42$ ,  $p < 0.05$ ). Even though they were pertinent, factors like student absences and device shortages had less statistical significance in affecting teaching methods.

#### 4.3.2.3 Adoption of Teaching Styles by Geographical Location

Building on information in RQ1 and data collected, the degree of **blended learning adoption varies geographically**. The results showed significant geographical variations in the adoption of instructional styles after the pandemic. 89% of educators said they continue to use interactive and blended learning strategies in metropolitan schools, which have relatively well-developed infrastructure. Of urban educators, 27% used flipped learning, and 18% used inquiry-based learning. Just 5% of respondents employed collaborative project-based frameworks. These methods show a consistent move toward student-centered learning and the use of digital resources to improve learning outcomes and engagement.

On the other hand, post-pandemic practices were somewhat maintained in rural schools. About 46% of rural educators said they were still using some aspects of blended learning, but 54% said they had either completely switched back to direct instruction from before the pandemic or made only minor adjustments. These results imply that educators' capacity to maintain innovative teaching strategies is influenced by their access to professional development opportunities and infrastructure.

Because of ongoing infrastructure and resource limitations, 79% of teachers in interior schools returned to traditional lecture-based instruction, demonstrating the lowest adoption of post-pandemic approaches. Blended learning approaches were only partially used by 21% of interior teachers. The low adoption rate emphasizes how instructional practices are impacted by insufficient electricity, poor internet connectivity, and a lack of gadgets.

### **4.3.3 Research Question 3: The effect of the changing role of teachers on the performance of students at the CSEC Examinations**

During the five-year period from 2019 to 2023, this section looked at how students' performance in the Caribbean Secondary Education Certificate (CSEC) exams at three chosen secondary institutions: Queen's College, St. Roses High, and Charity Secondary School, was affected by the changing roles and instructional responsibilities of teachers. School-level performance reports and past exam data from the Caribbean Examinations Council (CXC) were used in the analysis. The study aimed to find quantifiable correlations between changes in teaching modalities and students' matriculation outcomes using statistical modeling and trend analysis carried out using the SPSS software package.

The investigation was based on the understanding that the COVID-19 pandemic had a substantial impact on Guyana's educational system, requiring educators to take on a variety of responsibilities outside of the regular classroom. These responsibilities included curriculum change under pressure, emotional support, and digital facilitation. This section's findings provide quantitative proof of how those modifications affected student outcomes at the CSEC level, both directly and indirectly.

### 4.3.3.1 Overview of Analytical Model

**Table 5**

*Model Description for the Analysis of CSEC Results (2019–2023)*

**Model Description**

|   |             |
|---|-------------|
| Model Name  | MOD_1       |
| Dependent Variable                                | Year        |
| Equation  | Linear      |
| Independent Variable                              | Quadratic   |
| Constant  | Passed      |
| Variable Whose Values Label Observations in Plots | Included    |
| Tolerance for Entering Terms in Equations         | Unspecified |
|   | .0001       |

Table 5, which detailed the design utilized for the regression analysis of CSEC data from 2019 to 2023, provided an initial overview of the analytical model utilized for this investigation. Only statistically relevant parameters were kept in the equation by using a linear regression technique with a tolerance level of 0.0001 in the model, MOD\_1. By reducing the possibility of multicollinearity and random error, this strict inclusion requirement improved the findings' precision and believability. To ascertain whether there was a consistent or non-linear trend in the link between year and CSEC performance, both linear and quadratic equations were evaluated.

In the model, the independent variable was *Passed*, which represented the percentage of students who met matriculation requirements, and the dependent variable was *Year*, which represented temporal advancement. By adding a constant factor, baseline influences such as differences in resource availability, teacher qualifications, and school infrastructure were taken into account. For comparing schools with different resource contexts, especially urban coastal schools and those in rural interior regions, this offered a solid interpretive basis.

#### 4.3.3.2 Data Integrity and Case Processing

**Table 6**

*Case Processing Summary for CSEC Results (2019–2023)*

| Case Processing Summary |    |
|-------------------------|----|
|                         | N  |
| Total Cases             | 15 |
| Excluded                | 0  |
| Cases <sup>a</sup>      |    |
| Forecasted              | 0  |
| Cases                   |    |
| Newly Created           | 0  |
| Cases                   |    |

All fifteen instances (covering five years of data for three schools) were successfully integrated in the model without exclusions, demonstrating complete dataset integrity, according to the Case Processing Summary in Table 6. Given the very small sample size, the lack of missing or excluded cases highlighted the data's completeness and dependability. Additionally, complete data decreased the possibility of bias from missing observations, which is crucial for trend analysis when continuity between years is crucial. Table 5 served as a testament to the meticulous attention to detail and data integrity upheld in the analysis of CSEC results. Providing a transparent overview of case processing, enhances the credibility and reliability of the findings, empowering researchers and stakeholders to draw meaningful insights from the data.

**Table 7***Variable Processing Summary for CSEC Results (2019–2023)***Variable Processing Summary**

|   | Variables |             |
|---|-----------|-------------|
|   | Dependent | Independent |
|   | Year      | Passed      |
| Number of Positive Values   | 15        | 14          |
| Number of Zeros   | 0         | 1           |
| Number of Negative Values   | 0         | 0           |
| Number of Missing Values  | 0         | 0           |
| <div style="display: flex; justify-content: space-between;"> <span>User-Missing</span> <span>System-Missing</span> </div> | 0         | 0           |

With 15 positive observations for Year and 14 positive with one zero for Passed, Table 7, the Variable Processing Summary, verified that both dependent and independent variables were valid for analysis. Only three pupils took the test in 2021 at Charity Secondary because of pandemic-related disruptions, and the single zero number indicated a full non-performance year. A high level of data integrity was shown by the lack of system-missing and user-missing values, which reflected truthful reporting from the Ministry of Education and school registries.

Any observed variation in performance may be primarily ascribed to modifications in teaching environments and pedagogical responsibilities rather than data anomalies because of the consistency of data across variables. The choice to keep every case in the regression model was confirmed by this.

#### 4.3.3.3 Model Strength and Statistical Reliability

**Table 8**

*R-Square Analysis of CSEC Results (2019–2023)*

**Model Summary**

| R    | R Square | Adjusted Square | Std. The error of the Estimate |
|------|----------|-----------------|--------------------------------|
| .048 | .002     | -.074           | 1.517                          |

The independent variable is passed.

Table 8's performance indicators for the first regression model showed a R value of 0.048 and an R<sup>2</sup> of 0.002. According to these findings, just 0.2% of the variance in the dependent variable could be explained by the linear model. After controlling for sample size, the independent variable's inclusion did not improve the model's explanatory power, as further evidenced by the modified R<sup>2</sup> of -0.074. Significant variation between the observed and expected values was shown by the standard error of 1.517.

These figures showed a weak linear link, but they also showed how complicated and multifaceted educational performance was during the pandemic. Non-quantifiable contextual elements, such as students' access to devices, family stability, and parental participation, that were difficult to fully capture within a straightforward linear framework, most certainly had an impact on teacher role adaption, especially the unequal move toward digital pedagogy. As a result, although the low R<sup>2</sup> value at first indicated a poor model fit, it also indicated the need for a more nuanced interpretation in which teaching role modifications interacted with structural limitations from outside sources.

#### 4.3.3.4 Variance Analysis and Model Significance

**Table 9**

*ANOVA Summary for the Analysis of CSEC Results (2019–2023)*

**ANOVA**

|            | Sum of Squares | df | Mean Square | F     | Sig.  |
|------------|----------------|----|-------------|-------|-------|
| Regression | .070           | 1  | .070        | 0.030 | 0.865 |
| Residual   | 29.930         | 13 | 2.302       |       |       |
| Total      | 30.000         | 14 |             |       |       |

The independent variable is Passed.

Table 9's ANOVA summary shed more light on the importance of the regression model. The model was not statistically significant, as indicated by the regression sum of squares of 0.070, F-value of 0.030, and p-value of 0.865. This demonstrated that year-by-year changes in student pass rates were not sufficiently explained. The idea that a variety of concurrent factors, such as teacher preparedness, learning environments, and access to educational technology, influenced performance was supported by the residual mean square of 2.302, which showed that the bulk of the variance in CSEC outcomes remained unexplained.

Its contextual interpretation, however, is what makes this non-significant result significant. Teaching responsibilities saw a significant shift in 2020 and 2021. Inequitably, teachers' dual duties of facilitating technology and delivering material were divided among schools. While the lack of internet connectivity and decreased instructional interaction at Charity Secondary correlated with sharp drops in student performance, teachers' adaption to online instruction maintained student achievement in well-resourced institutions like Queen's College. As a result, the ANOVA findings subtly demonstrated that the impact of shifting teaching positions varied greatly depending on the location and infrastructure.

#### 4.3.3.5 Coefficient Analysis and Interpretive Insights

**Table 10**

*Coefficients from the Analysis of CSEC Results (2019–2023)*

**Coefficients**

|            | Unstandardized Coefficients |            | Standardized Coefficients | t        | Sig. |
|------------|-----------------------------|------------|---------------------------|----------|------|
|            | B                           | Std. Error | Beta                      |          |      |
| Passed     | -.002                       | .011       | -0.048                    | -0.174   | .865 |
| (Constant) | 2021.123                    | .807       |                           | 2505.461 | .000 |

The independent variable Passed had a negative unstandardized coefficient of -0.002, indicating an inverse but statistically insignificant connection with the dependent variable, according to the regression coefficients shown in Table 10. At standard confidence levels, the association was not significant, according to the matching p-value of 0.865. The presence of persistent baseline effects unrelated to year-on-year variation was confirmed by the substantial constant term ( $p < 0.001$ ).

This result demonstrated that although there were some variations in the overall yearly trend in CSEC performance, performance variations were explained by particular contextual factors rather than time. One important factor influencing results was the teachers' capacity to maintain curriculum consistency in times of crisis. Therefore, the statistical insignificance of Passed as a temporal predictor was consistent with qualitative observations: student accomplishment was influenced by modifications non-teaching methods rather than the occurrence of a new school year.

#### 4.3.3.6 Refined Modeling and Secondary Regression Analysis

**Table 11**

*Model Description for the Secondary Analysis of CSEC Results (2019–2023)*

**Model Summary**

| Coefficient<br>(R) | R-Square | Adjusted<br>R Square | Std. error |
|--------------------|----------|----------------------|------------|
| 0.359              | 0.129    | -0.016               | 1.476      |

The independent variable is Passed.

As seen in Table 11, a secondary model was later created to increase explanatory depth. With an R value of 0.359 and an R<sup>2</sup> of 0.129, this model indicated that the independent variable could explain about 12.9% of the variation in student performance. Despite being somewhat negative, the adjusted R<sup>2</sup> of -0.016 showed a little improvement over the original model. There was consistent variation between the expected and actual outcomes, as indicated by the standard error of 1.476.

Despite being slight, the rise in R<sup>2</sup> indicated that there was a more intricate connection between performance outcomes and educational adaptability. The findings suggested a lagged effect: students in resource-rich schools showed quantifiable improvements in exam performance as teachers progressively gained proficiency with new pedagogical tools between 2021 and 2023, whereas students in underequipped districts did not benefit in the same way. Therefore, the model's directionality supported the idea that changing teacher responsibilities had a delayed but noticeable impact on student outcomes, despite its weak statistical strength.

#### 4.3.3.6 Expanded Variance Analysis

**Table 12**

*Secondary ANOVA Summary for the Analysis of CSEC Results (2019–2023)*

**ANOVA**

|            | Sum of Squares | df | Mean Square | F    | Sig. |
|------------|----------------|----|-------------|------|------|
| Regression | 3.872          | 2  | 1.936       | .889 | .436 |
| Residual   | 26.128         | 12 | 2.177       |      |      |
| Total      | 30.000         | 14 |             |      |      |

The independent variable is passed.

The detailed results of the updated model were supported by the secondary ANOVA summary in Table 12. The model had better explanatory behavior than the primary analysis, although it remained statistically insignificant at the 5% threshold, according to the regression sum of squares of 3.872 and F-value of 0.889 (with  $p = 0.436$ ). The fact that a significant amount of the variance in CSEC results was still unaccounted for was highlighted by the residual sum of squares of 26.128.

Contextually interpreted, this residual variance probably reflected variations in the ways that educators in various settings managed their changing roles in the workplace. Systemic support systems including shared digital repositories, coordinated lesson planning, and school-based training helped educators in urban schools. Teachers in rural and hinterland schools, on the other hand, frequently worked alone without access to comparable institutional infrastructure. As a result, the statistical model's residual variance reflected the actual differences in teachers' ability to adjust, which subsequently impacted students' preparedness for the CSEC exams.

#### 4.3.3.7 Coefficient Refinement and Non-Linear Effects

**Table 13**

*Secondary Coefficients from the Analysis of CSEC Results (2019–2023)*

**Coefficients**

|             | Unstandardized Coefficients |            | Standardized Coefficients | t        | Sig.  |
|-------------|-----------------------------|------------|---------------------------|----------|-------|
|             | B                           | Std. Error | Beta                      |          |       |
| Passed      | -.054                       | .041       | -1.422                    | -1.324   | .210  |
| Passed ** 2 | .000                        | .000       | 1.419                     | 1.322    | 0.211 |
| (Constant)  | 2022.035                    | 1.045      |                           | 1935.071 | .000  |

The findings of the Caribbean Secondary Education Certificate (CSEC) regression study from 2019 to 2023 offered important information about the link between the dependent variable, which stands for the desired outcome, and the independent variable, Passed, together with its quadratic term. Passed has an inverse association with the outcome variable, as seen by its negative unstandardized coefficient (B). The value of this coefficient, however, indicates that the influence is negligible. This suggests that variations in the number of students who pass have little effect on the outcome variable. The estimate's variability is measured by the standard error of this coefficient, which is 0.041.

The amount of standard deviations that the dependent variable increased in response to a one standard deviation rise in Passed is represented by the standardized coefficient (Beta) for Passed, which is -1.422. The idea of an inverse connection is supported by the negative value. This relationship's statistical significance is debatable, though. The unstandardized coefficient is divided by its standard error to provide the t-value, which is -1.324. In order to

assess the trustworthiness of the coefficient estimate, this statistic is essential. The observed link may not be statistically significant at standard significance thresholds (e.g., 0.05 or 0.10), according to the related significance level (p-value = 0.210). Therefore, there is not enough data to draw the conclusion that Passed significantly affects the outcome variable.

Similarly, to take into consideration any non-linear correlations between Passed and the outcome variable, the quadratic term (Passed<sup>2</sup>) was included to the model. This term's unstandardized coefficient, however, is 0.000, suggesting a very little impact. Additionally, this coefficient's standard error is 0.000, indicating a high degree of estimate precision. A one standard deviation change in the squared value of Passed results in a comparable change in the standard deviation of the dependent variable, according to the standardized coefficient (Beta) for Passed<sup>2</sup>, which is 1.419. However, a t-value of 1.322 and a p-value of 0.211 show that this impact is not statistically significant. As a result, it seems that the quadratic component makes no significant contribution to the regression model.

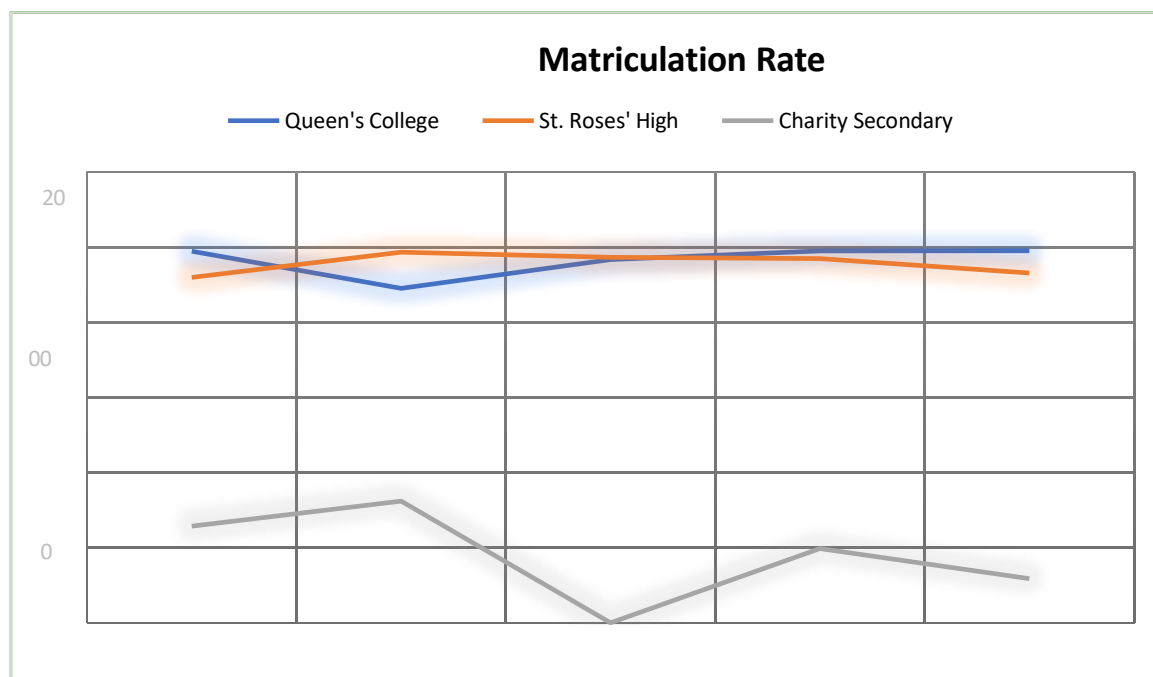
A constant term, which denoted the expected value of the dependent variable when all independent variables are set to zero, is also included in the regression model. With a standard error of 1.045, the constant term's unstandardized coefficient is 2022.035. When combined with a significance threshold below 0.001, the constant term's t-value of 1935.071 demonstrates its great statistical significance. This implies that, regardless of Passed and Passed<sup>2</sup>, the constant term is essential in deciding the outcome variable.

The lack of significance for the independent variables raised questions about how well the regression model captures the underlying relationships in the data, even while the constant term is highly significant, indicating that it makes a considerable contribution to the model. In order to better account for possible linear and quadratic correlations, this may indicate that the model has to be further refined by adding more explanatory variables or taking into consideration other functional forms.

#### 4.3.3.8 Graphical Trends in Student Performance

**Figure 8**

*Line Graph of Matriculation Rates at Queen's College, St. Roses High, and Charity Secondary for CSEC Results (2019–2023)*



The data results were supplemented by an exemplary visual representation of matriculation rates in Figure 8. The CSEC performance trends at Queen's College, St. Roses High, and Charity Secondary were contrasted in the line graph between 2019 and 2023. With its lowest reported matriculation rate of 89.13% in 2020 and its highest of 99.15% in 2023, Queen's College continuously maintained matriculation rates above 90%. This demonstrated the school's capacity to maintain high standards of instruction in spite of the difficulties associated with distance learning. With the help of well-established ICT infrastructure and administrative coordination, Queen's College teachers quickly adjusted to online modalities by utilizing digital learning environments like Google Classroom and Zoom.

Resilience was also shown by St. Roses High School, which kept matriculation rates between 92% and 98.77%. Even though the school was somewhat unstable, its teachers were able to maintain consistent student involvement by skillfully combining synchronous online sessions with the distribution of printed materials. This trend suggested that schools might lessen a large portion of the disruption brought on by the shifting instructional setting if they had reasonably equipped classrooms and flexible teaching staff.

Charity Secondary School, which is located in a remote interior area, on the other hand, showed a considerable decline in performance. With a total halt to passes (0%) in 2021, its peak matriculation rate of 32.43% in 2020 fell to 11.6% in 2023. Severe academic regression was caused in part by a lack of internet access and little interaction between teachers and students. The educational experience in these areas was fractured since teachers were forced to rely on radio broadcasts, printed worksheets, and sporadic in-person meetings. Therefore, the performance difference between Charity Secondary and the two urban schools empirically supported the idea that access to institutional and technical assistance was necessary for teachers to be effective in their expanding roles.

#### **4.3.3.9 Synthesis of Statistical and Graphical Findings**

While changes in teaching responsibilities were consistent among schools, the effects they had on student performance varied significantly along geographic and infrastructure lines, according to the convergence of statistical and visual data. Overall explanatory power was weak in the regression results, indicating that outcome variance could not be explained by the "change" variable alone. However, the school-level trends shown in Figure 9 made it abundantly evident that student performance either stayed the same or improved in those cases where educators were able to effectively take on their new responsibilities, which included integrating technology, changing pedagogy, and ensuring assessment continuity. On the other hand, student outcomes significantly declined in situations when teachers' changing roles were limited by resource constraints.

Together, these results demonstrated that the evolving role of educators had a mediated impact on CSEC performance, one that was filtered through contextual factors including teacher preparation, institutional support, and access to digital infrastructure. Thus, structural disparities in resource allocation exacerbated the differences in academic achievements throughout Guyana's educational areas, highlighting the multifaceted character of teacher effectiveness amid crisis-induced pedagogical adjustments.

#### **4.3.4 Research Question 4: Students' Perceptions of Changes in Teaching Strategies**

Students' opinions on modifications to traditional teaching techniques prior to, during, and following the pandemic were investigated in the fourth study question. In order to show improved interaction and involvement in classes after the pandemic, data were gathered via student surveys and examined using SPSS software. The presence of change and any link between the pandemic and the observed changes in teaching methods that students reported were determined using the chi-square test. The results of the data analysis were shown visually to show how students felt about post-pandemic teaching methods.

The employment of digital tools in the classroom was one of the most significant shifts that students noticed. A total of 64 students (35%) stated that using digital tools enhanced their educational experience. 54 students (30%) said that classes were more engaging when they used internet resources. According to 36 students (20%), the excessive use of PowerPoint presentations and video lectures by professors made courses more boring.

#### 4.3.4.1 General Analysis

**Table 14**

*Case Processing Summary for General Analysis*

#### CASES (Questionnaires)

|                  | VALID      |             | MISSING   |             | TOTAL      |            |
|------------------|------------|-------------|-----------|-------------|------------|------------|
|                  | NO.        | %           | NO.       | %           | NO.        | %          |
| <b>RESPONSES</b> | <b>183</b> | <b>82.4</b> | <b>39</b> | <b>17.6</b> | <b>222</b> | <b>100</b> |

Students' perceptions of how teaching strategies changed from traditional approaches prior to the COVID-19 pandemic to those used during and after it were investigated. The goal was to comprehend how the students saw these innovative tactics' perceived effectiveness, level of engagement, and learning results. 222 students from three high schools were given questionnaires to complete in order to gather data; Table 14 displays the 183 valid responses (82.4%) that were used in the analysis. In order to preserve dependability, missing replies (17.6%) were eliminated. Chi-square tests and descriptive statistics were used in the analysis to assess trends and significance in students' perceptions.

#### 4.3.4.2 Integration of Digital Tools in Learning

**Table 15**

*Analysis of Survey Responses by Students to Noticeable Changes in Teaching Styles*

#### RESPONSES

|       | Lost<br>Attention | Improved<br>Learning | No Changes<br>Noted | Monotonous | TOTAL |
|-------|-------------------|----------------------|---------------------|------------|-------|
| TOTAL | 36                | 64                   | 29                  | 54         | 183   |

Students cited the growing use of digital technologies as the most significant shift. Table 15 shows that 64 students (35%) said that their educational experience was greatly benefited by technology-assisted learning. In contrast to the teacher-centered lecture-based methods that were common prior to the pandemic, interactive and self-paced learning were made possible by digital platforms, online simulations, and educational software. Students emphasized how these resources made it easier to understand difficult ideas, practice repeatedly, and independently research the material—opportunities that are restricted in traditional classroom learning.

Additionally, online materials improved participation. Fifty-four students (30%) said that lectures that used online resources were more interactive, demonstrating the advantages of tools like Google Classroom, Microsoft Teams, and group conversations backed by WhatsApp that allowed for peer cooperation and real-time feedback. These results show that, especially in schools where teachers received training in hybrid or online instruction, students perceived observable gains in learning outcomes as a result of the use of digital tools.

Some pupils mentioned disadvantages in spite of these favorable opinions. Thirty-six students (20%) thought that the overuse of pre-recorded video lectures and PowerPoint presentations made classes boring and decreased students' interest and focus. Furthermore, 29 students (16%) said that there had been no discernible change in the instructional strategies, indicating variations in execution. These findings show that merely implementing technology does not always improve learning; active participation and good pedagogical design are still essential. Because of structural and resource disparities, schools that lacked sufficient digital infrastructure or educators who were proficient in online instruction were unable to fully adopt hybrid tactics.

#### 4.3.4.3 Statistical Analysis of Student Perceptions

**Table 16**

*Chi-square Analysis of student's responses to the impact of the changes noticed to learning*

|                    | VALUE           | df       | Asymp. Sig. (2 sided) |
|--------------------|-----------------|----------|-----------------------|
| Pearson Chi-Square | <b>183.000a</b> | <b>3</b> | <b>0.000</b>          |
| Likelihood Ratio   | <b>159.987</b>  | <b>3</b> | <b>0.000</b>          |
| Valid Cases        | <b>183</b>      |          |                       |

a. 1 cells (12.5%) have an expected count of less than 5. The minimum expected count is 4.60.

The association between students' perceptions and observed teaching adjustments was investigated using chi-square analysis (Table 16). With three degrees of freedom, the Pearson Chi-Square value was 183.000 ( $p = 0.000$ ), and the Likelihood Ratio was 159.987 ( $df = 3, p = 0.000$ ). The statistically substantial p-value suggests that rather than being random, students' opinions were significantly correlated with modifications in instructional tactics. The overall validity is unaffected by a small limitation: one cell (12.5%) had an expected count below five, with a minimum of 4.60. These findings corroborate the notion that there were wide variations in student experiences, representing both favorable and unfavorable opinions of post-pandemic instructional techniques.

#### **4.3.4.4 Structural and Contextual Factors Influencing Perceptions**

School policies, teacher competency, and technology access were among the structural elements that were strongly correlated with the perceived level of development. While students in resource-poor schools reported monotony or little change, students in well-resourced schools with teachers skilled in digital pedagogy reported improved engagement and learning results. Urban schools were able to use interactive and hybrid teaching methods more successfully than interior or rural schools, emphasizing structural imbalances, thanks to dependable internet connectivity and professional development for educators.

These results show that post-pandemic changes in education were not applied consistently. Student opinions were greatly influenced by variations in administrative support, teacher readiness, and technology infrastructure, highlighting the necessity of systemic changes to guarantee uniform learning opportunities across schools.

#### **4.3.4.5 Impact on Engagement and Learning Experience**

Collaborative exercises, online simulations, and real-time feedback were highlighted by students who claimed improvements. Higher-order thinking abilities, motivation, and participation were all improved by these tactics. Students who encountered monotony, on the other hand, highlighted an excessive dependence on passive information delivery, suggesting that instructional design, not only technology, impacts success.

Additionally, more individualized, self-directed learning was made possible by digital tools. Outside of class, students could practice exercises, go through materials at their own speed, and study material on their own. Pre-pandemic instruction, which depended on consistent pacing and teacher-led delivery, is in contrast to this autonomy. A balanced paradigm that supported both self-directed learning and organized teacher support was found in hybrid systems that combined digital resources with in-person instruction.

#### **4.3.4.6 Equity and Accessibility Considerations**

It was evident that there were still gaps in access to post-pandemic instructional innovations. While under-resourced schools trailed behind, schools with sufficient facilities and qualified educators were able to successfully adopt hybrid approaches. The necessity for legislative interventions to overcome infrastructural gaps, offer professional development in digital pedagogy, and guarantee equitable access to technology and learning materials is highlighted by the way that these structural limitations led to disparate student experiences. The potential advantages of post-pandemic instructional advances are limited in the absence of such measures, which keep pupils in under-resourced schools at a disadvantage.

#### **4.3.4.7 Relationship Between Observed Changes and Student Experience**

Students' perceptions are significantly correlated with the changes in teaching practices that have been seen since the pandemic, according to the statistically significant Chi-square results (Table 15). Schools with digital platforms, online pedagogy training for teachers, and institutional support for hybrid learning were generally the ones that saw advances. The majority of students who reported no change or boredom attended schools with few resources or had teachers who were not ready for digital instruction. These results emphasize how crucial pedagogical, structural, and contextual preparedness are in assessing the effectiveness of novel teaching techniques.

#### **4.3.5 Research Question 5: Improvement to teaching and learning methodologies in the post-pandemic era.**

In addition to identifying suggestions made by educators and students to improve learning after the pandemic, the fifth research question aimed to examine how these suggestions reveal systemic flaws in Guyana's secondary education system. While teachers' and students' concerns about pedagogy, technology, and engagement are similar, the responses also highlight deeper systemic problems, including a lack of institutional support, uneven training methods, and the national curriculum's limited ability to adapt to hybrid contexts. As a result, this part applies a structural interpretation to their recommendations, looking at how they represent institutional capabilities and limitations in maintaining educational change during the pandemic.

While widely utilized in qualitative research, thematic analysis was not without its complexities and potential pitfalls. Lochmiller (2021) aptly highlighted the prevalence of theme analysis in research practices yet underscores the need for cautious interpretation due to inherent inaccuracies. This sentiment resonates with the observations of Michelle and Lara (2020), who note the widespread use of theme analysis but caution against its frequent misinterpretation. Despite these challenges, thematic analysis remained a valuable method for uncovering underlying patterns and themes within qualitative datasets.

Three significant areas influencing post-pandemic learning experiences were found through thematic analysis of the student data: support and accessibility, technological integration, and pedagogical improvements. Four interrelated themes emerged from teacher data: curriculum modernization for relevance, flexible and student-centered assessment, technology-enhanced learning settings, and capacity building for digital and hybrid teaching. Together, these results reveal a structural dependency among student involvement, institutional preparedness, and teacher competency. These viewpoints' convergence

emphasizes the need for a systemic strategy that concurrently tackles student-centered pedagogy, technology infrastructure, and teacher preparation in order to improve post-pandemic education.

In synthesizing these insights, educators were empowered to craft more inclusive and effective teaching environments responsive to the diverse needs and challenges of post-pandemic students. Visual representations offer a compelling means of conveying these findings, facilitating data-driven decision-making, and fostering collaborative dialogue within educational communities.

#### 4.3.5.1 Improvement to Teaching Post-Pandemic (Students)

**Table 17**

*Student Recommendations for Improving Teaching Post-Pandemic*

| THEMES                       | NO. OF RESPONSES | PERCENTAGE (%) |
|------------------------------|------------------|----------------|
| PEDAGOGICAL<br>ENHANCEMENTS  | 45               | 24.6           |
| TECHNOLOGY<br>INTEGRATION    | 83               | 45.5           |
| SUPPORT AND<br>ACCESSIBILITY | 55               | 29.9           |
| <b>TOTAL</b>                 | <b>183</b>       | <b>100</b>     |

Thematic analysis of the responses provided yielded several key themes that emerge from the participants' feedback regarding their learning experiences. Each theme reflects a specific aspect of the learning process, and the frequency of responses indicates the prevalence of each theme among the participants:

## I. Pedagogical Enhancements

A sizable percentage of participants (16 students; 8.8%) favored instructional strategies that promote involvement, active engagement, and teamwork and stressed the value of interactive learning. Student comments provide additional support for this choice in the qualitative data.

*“Sometimes the lessons are a bit boring since it is the different content done the same way. More interactive way of teaching where we get to express and discover the information that is to be taught” (Student 11)*

According to this response, students believed that interactive approaches can improve their comprehension and memory of material. According to the results, passive information delivery techniques like traditional lectures might not be as successful at sustaining student interest and promoting in-depth learning.

Eleven students (6.0%) indicated that they preferred project-based learning methods in addition to interactive learning. PBL, which incorporates group and practical exercises, is an effective method for developing creativity, critical thinking, and problem-solving skills. These results demonstrate how important students think active participation in the learning process is, especially in STEM courses where conceptual knowledge is essential. One participant articulated this concern by stating,

*“There need to be classes where the activities are hands-on and less lecturing. Especially in Mathematics and Science, it is difficult when they just show you the problem and how it is solved and then give you exercises to work. There are no activities that allow us to be more critical or even to challenge the work. We are just doing one thing over and over in the same way” (Student 31).*

Additionally, compared to conventional one-way teaching techniques, the quantitative evidence supports the idea that interactive and project-based learning approaches lead to higher levels of engagement, which improves information retention and understanding.

Another recurrent trend in the findings was the significance of good communication between teachers and students; 18 participants (9.8%) emphasized the value of clear expectations, instructions, and feedback for academic performance. Effective learning was found to be hampered by unclear assessment instructions and a lack of feedback on student performance. Students' academic performance was eventually impacted by this lack of clarity and organized feedback, which was linked to increasing anxiety and misconceptions. One participant stated:

*“Many times, especially when assessments are given, the instructions of what they need are not always concise until you submit the assignment. Then you see what they need is not what you did. Additionally, in many cases, the teachers never give feedback on the grades. You see the grades until it is time to leave the class, or you get a low grade and they don't show why or where you lost marks” (Student 80).*

The lack of uniform standards for remote assessment techniques was another issue raised by educators. According to the research, students who got thorough explanations and organized comments did better on tests. Furthermore, effective communication decreased assignment-related anxiety and misconceptions, highlighting the significance of openness in teaching methods.

The implementation of post-pandemic pedagogy has been structurally limited, as these recommendations suggest. Uneven learning experiences across schools have been caused by the dependence on individual teacher initiative rather than a coordinated institutional framework for blended instruction. Thus, students' requests for increased

involvement indicate a systemic need for organized, policy-level guidance on hybrid engagement tactics in addition to pedagogical preferences.

## 2. Technology Integration

The majority of participants (83 responses) acknowledge the benefits of blended learning approaches, which combine online and face-to-face instruction to optimize learning outcomes. This theme suggests that students value the flexibility and accessibility afforded by blended learning models, which integrate technology-enhanced activities with traditional classroom instruction. Responses from students supported the data collected:

*“Our classes are very big and many times before we get to ask questions for clarity, the session ends. The notes should be shared via Google Classrooms and other mediums so that we can go back in our free time and recheck the information.”*  
(Student 64)

*“During the pandemic, we would have used online classrooms; now that we are back in classes, it would still be good if the teachers utilized the classrooms to supplement work in and out of the classrooms. Our school has a smartboard, and many times they don’t use it. They can have the resources utilize the online and traditional ways and make us enjoy the lessons more.”* (Student 27).

In terms of structure, this trend indicates that schools, particularly those in coastal and hinterland areas, have different levels of digital infrastructure. The continued disparity in access highlights the lack of a national framework for educational digital inclusion. Effective post-pandemic education, as demonstrated by students' experiences, requires institutional investment in connectivity, hardware, and maintenance systems to maintain equal learning environments in addition to educators' flexibility.

*Overall*, a mixed learning paradigm that combined online and in-person training was selected by 83 students (45.5%). Increased Engagement: Students who attended schools that used Google Classroom and other online tools showed improved recall of the material. One of the main obstacles mentioned by 21 educators (30.4%) was the absence of resources for hybrid instruction. This would have affected student learning by allowing an increased digital accessibility: students' achievement rates were greater in schools with dependable gadgets and internet. Additionally, better teacher preparedness: teachers can apply online tactics more successfully when they get ongoing digital training.

### **3. Support and Accessibility**

The study's conclusions highlighted how important academic support services are to improving student learning outcomes. The importance of organized academic support, adaptability in the way lessons were delivered, and screen time management in fostering student achievement is demonstrated by a mix of qualitative and quantitative evidence. The fact that 55 participants (29.9%) recognized the importance of student support services—such as tutoring, advisory help, and teacher guidance—indicates that these tools enhance engagement, academic achievement, and general well-being. However, issues with course flexibility, digital readiness, and insufficient teacher support turned out to be crucial areas in need of improvement.

A quantitative analysis showed that a lack of educator assistance made independent learning difficult for 35 students (19.1%). Students often highlighted the need for more organized support, citing the absence of instructional supervision as a hindrance to academic progress.

*“Many times work is given and we are left to do it on our own, even though some knows what to do sometimes we are lost as to how to get the achieved objective. The teachers*

*need to play a better role in assisting and guiding us. Not all of us can identify the objective clearly and may need more assistance to get the same thing covered as our friends.” (Student 24)*

This feedback aligned with the data set's larger patterns, which indicate that students who had access to formal support systems—like tutoring, mentorship, and office hours—performed better in their courses. To reduce learning gaps and improve academic performance, these findings support the necessity for educational institutions to create institutionalized teacher-student interaction initiatives.

Demand for more flexibility in assignment deadlines and instructional delivery was also noted by the study. Ten students (5.4%) specifically mentioned that strict deadlines and lesson plans made it difficult for students to balance several academic disciplines.

*“In many cases, we are writing several subjects for CSEC, and as such, we cannot attend classes all the time. There needs to be accommodation made by teachers to understand the pace at which we study and the needs of every student. There should be some compromise to accommodate each student so that they can learn even though we don't learn at the same pace.” (Student 9)*

Students from institutions that used recorded lectures and asynchronous learning modules reported greater success rates, which is supported by quantitative analysis. According to these results, including flexible learning techniques—like self-paced course materials and adjustable due dates—could meet the demands of a wide range of students and improve academic engagement.

Ten students (5.4%) expressed worry about the effects of extended screen use on their mental health. Students advocated for regulated screen time management measures when it was determined that digital tiredness was a hindrance to successful learning.

*“While we enjoy the online methodology, there needs to be a balance in a few classes. The teachers send the work on our phones on the day of the class, and we have to look at our devices while following the teachers. While it is nice to have the work before, it is difficult to be staring at a phone through nearly 60 minutes of classes. There should be some break or activity that balances its uses.” (Student 108)*

These concerns were supported by empirical research, which shows that too much screen usage is linked to cognitive tiredness and poor focus. Schools that used hybrid learning strategies, off-screen homework, and scheduled break times reported higher levels of student well-being and engagement. These results imply that while preserving academic rigor, blended learning models—which incorporate both digital and offline activities—may be useful in lowering students’ weariness.

The focus on emotional connection and empathy draws attention to a larger structural issue: the dearth of wellness initiatives, school-based counseling, and frameworks for teacher well-being. The necessity for institutionalized socio-emotional learning systems rather than haphazard teacher initiatives is revealed by students' demands for motivation, which reveal a deeper imbalance between academic goals and psychological support.

**Overall**, the findings emphasized that to maximize student learning experiences, structured academic assistance, adaptable learning spaces, and screen time control techniques are essential. According to quantitative data, 5.4% of students support more flexible lesson plans and moderate screen time, whereas 19.1% of students find it difficult to learn on their own because of a lack of teacher assistance. The necessity for extensive institutional interventions, such as organized academic support programmes, flexible teaching strategies, and well-balanced digital learning frameworks, is highlighted by these statistical findings combined with qualitative input.

In order to maximize learning experiences, the analysis emphasized the significance of improved support systems, student-centered and interactive learning methodologies, and thoughtful technological integration. By addressing these issues, educational practices can become more successful and promote accessibility, engagement, and long-term academic achievement. Teachers may establish a learning environment that meets the needs and expectations of their students by implementing engaging pedagogical techniques, bolstering student support systems, and skillfully integrating technology.

**Figure 9**

*Bar Graph of Student Responses on Improving Teaching and Learning Post-Pandemic*

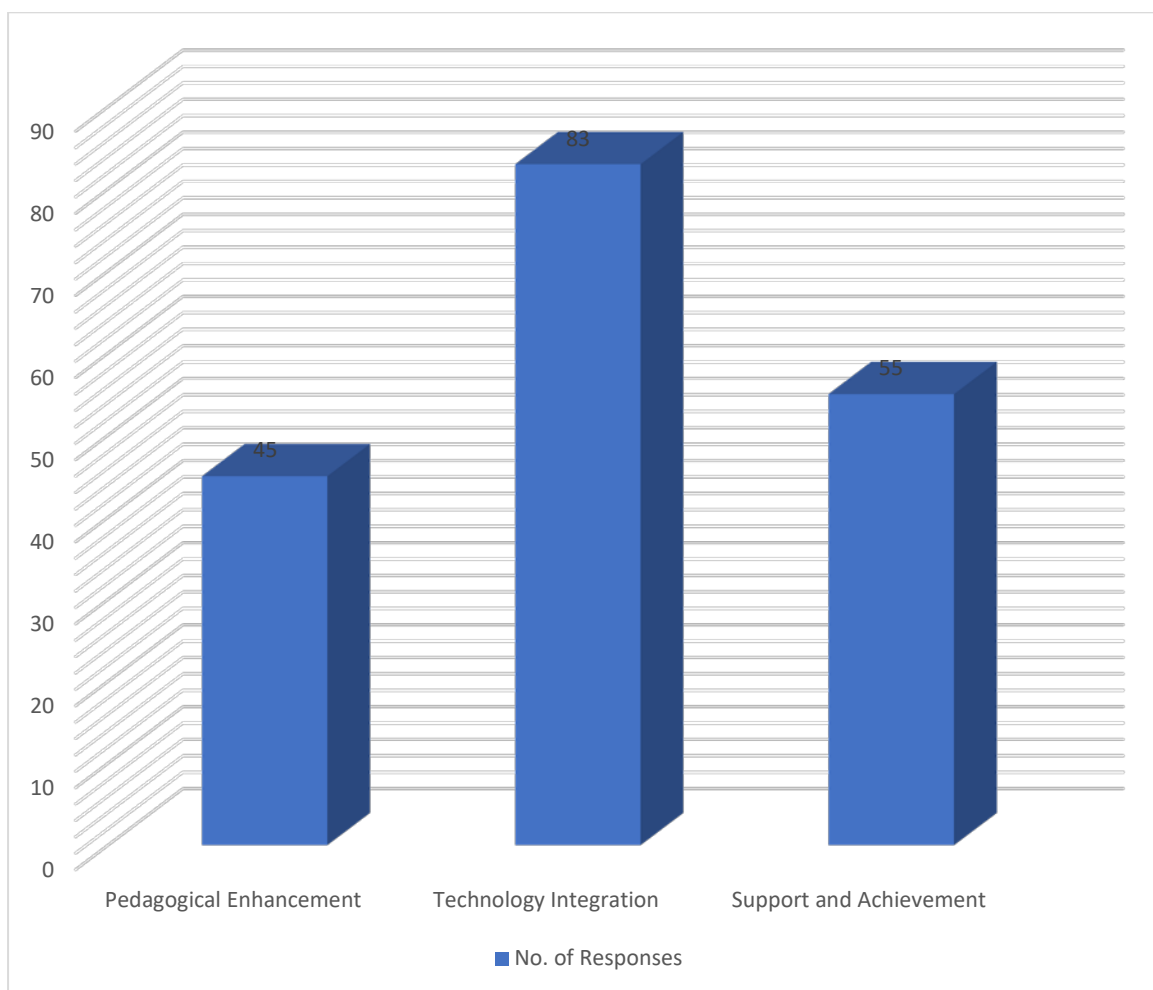


Figure 9 is a bar graph that represents the data that is displayed in Table 17, showing the students' responses to the improvement of teachers' styles post-pandemic. The majority identified *Technology Integration* with 45.5% of the responses, which accounts for 83 students; the least responded was *Pedagogical Enhancement* with 24.6% of the respondents, but this was a difference of 10 respondents for *Support and Accessibility* with the remaining 29.9% of the respondents.

The results of the examination of teacher replies about the advancements in education in the post-pandemic period were shown in this section. Four major themes emerged from the thematic analysis of the data gathered from questionnaires and interviews: *curriculum modernization for real-world relevance, flexible and student-centered assessment methods, technology-enhanced and supportive learning environments, and capacity building for digital and hybrid teaching*. The influence of these themes on students' learning experiences is demonstrated by including qualitative (teacher comments) and quantitative (survey answers) data.

#### 4.3.5.2 Improvement to Teaching Post-Pandemic (Teachers)

**Table 18**

*Table 18 shows the responses of teachers towards improving teaching and learning post-pandemic*

| THEMES  | NO. OF RESPONSES | PERCENTAGE (%) |
|---|------------------|----------------|
| CAPACITY BUILDING FOR DIGITAL AND HYBRID TEACHING       | 27               | 39.1           |
| FLEXIBLE AND STUDENT-CENTERED ASSESSMENT METHODS        | 10               | 14.5           |
| TECHNOLOGY ENHANCED AND SUPPORTIVE LEARNING ENVIRONMENT | 17               | 24.6           |
| CURRICULUM MODERNIZATION FOR REAL WORLD RELEVANCE       | 15               | 21.8           |
| <b>TOTAL</b>  | <b>69</b>        | <b>100</b>     |

**Figure 10**

*Bar Graph of Teacher Responses on Improving Teaching and Learning Post-Pandemic*

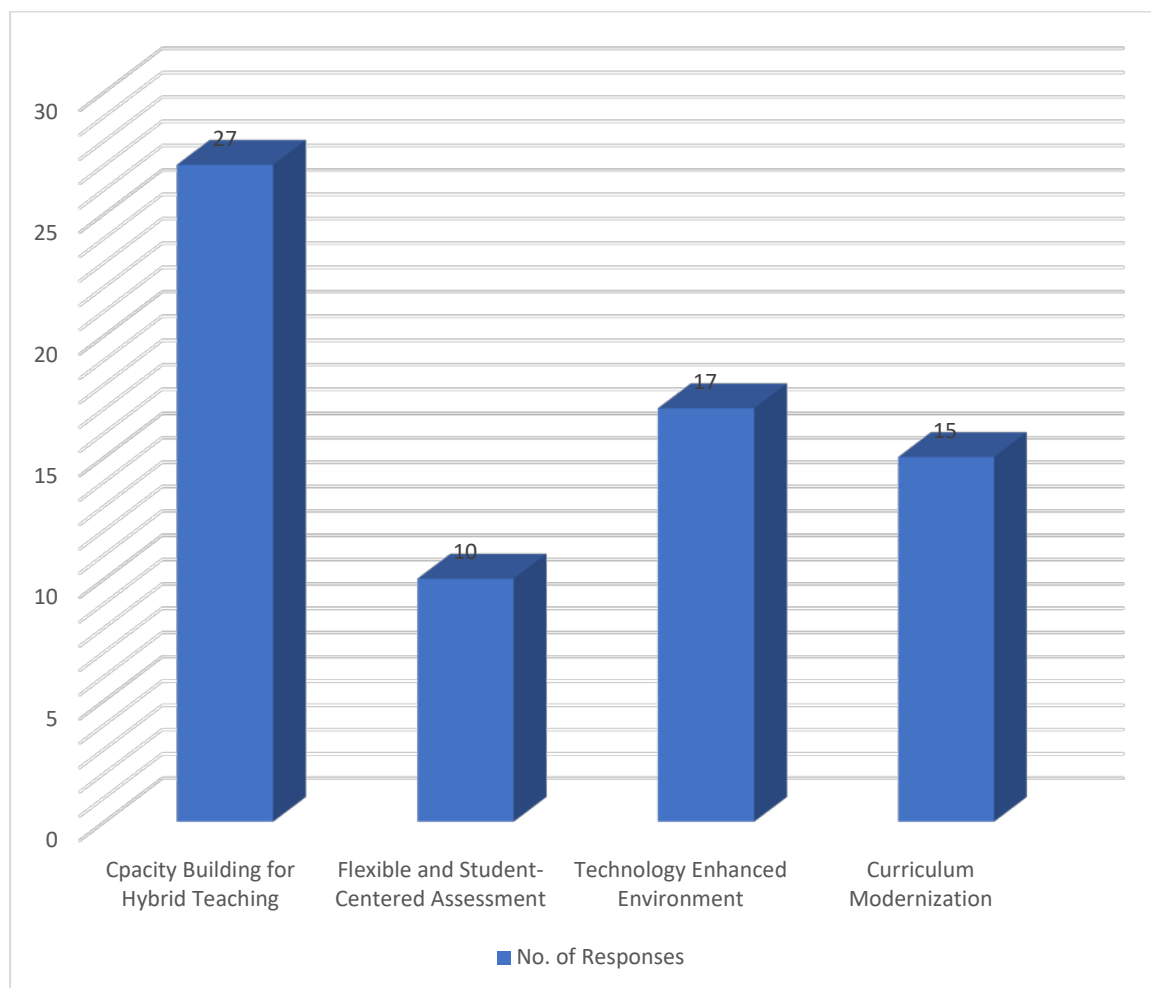


Figure 10 is a bar graph that represents the data that is displayed in Table 18, showing the teachers' responses for the improvement of their styles post-pandemic. The majority identified **Capacity Building for Digital and Hybrid Teaching** with 39.1% of the responses, which accounts for 27 teachers, and the least responded would be **Flexible and Student-Centered Assessment Methods** represented by 14.5% of the sample or 10 responses.

A thematic analysis of the provided information reveals several key themes reflecting the participants' perspectives on various online teaching and learning aspects. Each theme represents a specific focus area related to online education, and the frequency of responses indicates the relative importance or prevalence of each theme among the participants:

### **1. Capacity Building for Digital and Hybrid Teaching**

The need for resources and professional development to support online and hybrid teaching approaches was recognized by 39.1% (n=27) of educators. Many educators voiced worries about the need for organized training and their lack of digital competency.

*“We would appreciate using technology, but in our years of training, we would have never experienced using certain online platforms. As such, we feel if we do not know how to use it, it would make our work more difficult to use it. However, we are willing to use it since it can assist us in teaching. The Ministry needs to allocate specialists to edify us on the proper and effective use of these online aids.” (Teacher 6)*

Teachers highlighted the advantages of hybrid learning, but they also pointed out a lack of institutional support and resources. The necessity of organized frameworks for integrating hybrid learning models was emphasized by a sizable majority (30.4%, n=21).

*“To implement the hybrid method is the best approach to teaching at this time; however, due to lack of resources and support, it is quite difficult to implement” (Teacher 10)*

*“We are utilizing the hybrid method, and it is helping. However, we lack the resources and the support to fully implement it in all the classes we have, and this is a disenfranchisement to students” (Teacher 46)*

Insufficient professional development has a detrimental influence on student learning by reducing the efficacy of online education. On the other hand, especially in hybrid learning settings, student engagement and understanding increase when teachers receive focused

digital training. More interactivity, flexibility, and effective technology integration into classes are the results of improved educator competency in digital pedagogy.

## **2. Flexible and Student-Centered Assessment Methods**

According to teachers, the various learning demands of students were not adequately taken into consideration by standard evaluation techniques. Project-based and competency-driven assessments are two examples of more flexible and inclusive assessment methods that were supported by 14.5% (n=10) of respondents.

*“Sometimes the administration of the schools, only wants us to give assignments and tests as assessment for students. This is sometimes a bit difficult, especially with weaker students but it does not mean that they did not learn. There should be the flexibility to utilize assessments such as projects to evaluate the students.” (Teacher 28)*

With the advent of adaptable assessments, students can now exhibit their knowledge in ways that best suit their abilities. Academic performance is eventually improved by this change, which also fosters varied learning styles, improves critical thinking, and lessens test-related anxiety.

The inflexibility of Guyana's centralized educational system is highlighted by the demand for curriculum flexibility. Teachers' struggles to modify pace and evaluation show how localized innovation is stifled by top-down curriculum directives. Teachers' ability to contextualize learning for hybrid environments is hampered by this institutional rigidity, which emphasizes the need for decentralized curriculum frameworks that provide school-level educators more authority.

## **3. Technology-Enhanced and Supportive Learning Environments**

Additionally, with a total of 24.6% of the respondents highlighted the need for

enhanced environment. With 7.2% (n=5) of participants emphasized the necessity of an institutional structure that supports administration and educators working together to deploy online and hybrid learning methodologies:

*“I use online methods to supplement classroom work, but it is quite difficult for me sometimes since it is my responsibility alone to get it done. The administration sometimes says that the Ministry has returned to a traditional setting and all the resources given are for that. The environment sometimes deters you from trying other methods, forcing you to fall into their ways. They should build a more supportive hand in trying to blend the online environment with traditional.” (Teacher 64)*

Although differences in resource availability were apparent, 17.4% (n=12) of respondents emphasized the significance of integrating technology in educational settings. While some schools lacked the required infrastructure, others had access to digital tools, high-speed internet, and smart boards.

*“At the top school, we would have heard that technology has been integrated into the classroom, whereby all classes have access to smart boards, internet and devices. That school always performs well at CSEC and CAPE. However, we do not get that same privilege, our schools would make great use and it is tested as seen by that school that if we integrate technology our teaching sessions were more interactive.” (Teacher 50)*

Self-directed study, interactive learning, and increased student engagement are all facilitated by having access to well-integrated digital resources. In contrast, the absence of these tools puts students at a disadvantage in a technologically advanced academic and professional setting by limiting their exposure to digital literacy abilities.

An unofficial reaction to institutional isolation can be seen in teachers' interest in peer collaboration. Schools function in silos, depending on individual initiative, as seen by the absence of formal professional learning communities or avenues for inter-school

communication. From a structural perspective, this implies that there are no networks for knowledge sharing and capacity building among educators that are supported by policy.

#### **4. Curriculum Modernization for Real-World Relevance**

Fifteen (15) educators, or 21.8% of the total, supported curriculum revision to include digital literacy and real-world applications. Many pointed out that the existing curriculum still places a lot of emphasis on antiquated teaching methods that don't meet the changing needs of contemporary education.

*“It is archaic that we have 21st-century needs and 19th-century curriculum, the curriculum needs to be revised to suit the needs of the students and teachers so that better teaching can be done.” (Teacher 55)*

*“Our present curriculum does not meet the need for a hybrid approach but mainly traditional teaching. The curriculum needs to be revised to not only show a hybrid approach but also the use of technology in the classes conducted. If this is done the new teachers especially would have guidance on how to actively engage the students in this era.” (Teacher 60)*

An updated curriculum gives students the digital literacy, critical thinking, and practical skills they would need for their future employment. Students are more engaged, more equipped for the workforce, and better able to apply theoretical knowledge to real-world situations when instructional content is in line with current issues.

**Overall**, the theme analysis emphasized how urgently curricular reform, flexible assessment, teacher training, and fair access to technology are needed to improve learning after the pandemic. The numeric information demonstrates how common these worries are among teachers, but the qualitative answers shed more light on the difficulties encountered. By taking care of these issues, schools may increase student involvement, adapt to different

learning preferences, and guarantee that students acquire critical digital skills. Recommendations for post-pandemic education policy formation, resource allocation, and instructional improvements are based on these findings.

When examined together, the viewpoints of educators and students demonstrate a common understanding of the systemic flaws of Guyana's post-pandemic educational system. The lack of emotional support networks, unequal access to digital resources, restricted curricular flexibility, and deficiencies in teacher preparation are cited by both groups. Therefore, the structural analysis indicates that institutional coherence—through coordinated policies, continuous professional development, and egalitarian digital infrastructure—is more important for the durability of post-pandemic learning than individual effort. The following recommendations in this study are empirically supported by these findings.

#### 4.4 Evaluation of Findings

For the *first research question* the results showed that rather than a complete pedagogical shift, post-pandemic teaching practices in Guyana's secondary schools represented a selective, context-dependent adoption of digital technologies. Teachers' ongoing use of virtual aids, such as interactive presentations, simulations, and multimedia materials, showed that they understood how technology may improve accessibility, student engagement, and lesson delivery. McCarthy and Anderson's (2000) criticism of conventional lecture-based training, which prioritized passive knowledge absorption over active learning, is consistent with this perseverance. Although virtual aids are mostly used as a supplement to traditional methods rather than as a replacement, their adoption indicates a move toward more dynamic learning settings. In a similar vein, Jaques (1992) contended that old approaches are out of step with current educational objectives; Guyana's techniques show some agreement with modern, student-centered teaching.

Furthermore, Hargreaves (2003) argued that the incorporation of digital technologies changes students' expectations by transforming teachers into knowledge facilitators rather than single providers. This argument supports the findings that educators used digital tools and blended learning models to differing degrees. The extent and kind of technology adoption were mediated by the demographic and professional traits of educators. While mid- and late-career teachers depended more on professional development and institutional support to maintain new practices, early-career educators shown higher flexibility to online resources. Digital resource integration was more common among teachers with higher degrees or previous ICT training, indicating the value of focused professional development for maintaining creative pedagogy.

There were clear gender differences, with female teachers emphasizing pedagogical uses like interactive lessons and group projects, while male teachers preferred structural

applications like learning management systems. These trends show that gender-based pedagogical orientation, experience, and professional development had a major impact on long-term post-pandemic practices. Additionally, the results indicated that educators who participated in workshops or training during the pandemic were more likely to keep utilizing technology in an engaging manner, underscoring the need of continuous capacity-building programmes in fostering long-term changes in education.

These results were supported by student opinions, as 91% of them reported observable modifications to teaching strategies. Nonetheless, the assessment revealed that technological tools were mostly used for administrative tasks like assignment management, attendance monitoring, and course communication rather than for interactive, student-centered learning. This indicates that structural rather than pedagogical uses of technology predominate. In a similar vein, Cuban (2020) noted that integrating technology into instruction frequently improves efficiency without radically altering instructional strategies. This suggests that although blended learning methods have gained acceptance in the Guyanese setting, their pedagogical integration is still unequal.

The importance of authentic, project-based learning was highlighted by Cooperstein & Kocevar-Weidinger (2004); nevertheless, structural obstacles such as curriculum limitations, inadequate teacher preparation, and high-stakes standardized testing prevented these approaches from being widely adopted. As a result, the results indicate that while technology has played a significant role in pedagogy in maintaining continuity, its ability to alter classroom dynamics has been restricted.

The sustainability of digital practices was further influenced by regional differences and resource constraints. While teachers in rural or resource-constrained areas used low-bandwidth solutions like WhatsApp groups, educators in metropolitan coastal schools used a variety of platforms, such as Google Classroom, virtual aides, and blended learning. This

brought to light enduring disparities that limited fair access to learning aided by technology. Similar to the experiences seen in Guyana, Sentance & Csizmadia (2017) and Sentance et al. (2020) point out that adopting computing and programming education involves substantial hurdles, such as teacher confidence, curriculum restrictions, and hardware availability. These results highlight the need for focused policies to promote the development of infrastructure, guarantee fair access, and offer qualified advice to educators working in a variety of environments.

Overall, the assessment shows that rather than a complete pedagogical makeover, the pandemic sparked a partial shift in teaching methods, focusing on the practical incorporation of technology. Access to infrastructure, institutional backing, and professional skill were necessary for sustained adoption. The findings imply that in order to guarantee that technology integration progresses from a useful adjunct to a revolutionary pedagogical approach, legislative interventions are required to improve teacher preparation, offer continuing ICT support, and address resource disparities. The report also emphasizes how crucial it is to conduct ongoing monitoring and assessment in order to gauge how digital adoption affects student learning results, engagement, and equity. Maintaining digital practices is a significant step in Guyana's secondary education modernization process, but in order to achieve fair and significant integration across schools, systemic issues must be resolved.

Finally, the results indicate the wider ramifications for future research, teacher preparation, and educational policy. The need for specialized professional development programmes that take into account teacher experience, pedagogical orientation, and resource availability is highlighted by the selective character of technology adoption. To guarantee that the advantages of digital technologies go beyond practical ease, methods for incorporating interactive and real-world learning experiences should also be given top

priority. Future research should look at the long-term effects of adopting blended learning, with an emphasis on the ways in which digital pedagogies affect systemic equality, teacher confidence, and student results.

The impact of local environmental and infrastructure factors on pedagogical practices was highlighted in the *second research question*, which examined the differences in teaching styles among Guyana's several geographical regions. The results showed that the acceptance and durability of post-pandemic teaching strategies, especially blended and student-centered learning, were influenced by location. The Coastal Plain is home to the majority of Guyana's population and offers relatively dependable access to digital learning resources, internet connectivity, and energy. The Forested Highland and Interior Savannah regions, on the other hand, have sparse people and significant obstacles to obtaining these essential resources. The study divided the four geographical divisions into urban, rural, and interior regions for analytical purposes, taking into account resource availability as well as population density.

According to survey responses, 48.1% of educators cited unpredictable power sources as a serious obstacle, making electrical reliability the most significant difficulty affecting instruction. 25.9% of respondents mentioned problems with internet connectivity, especially in interior schools where the majority of instructional materials were offline. Furthermore, 13% of educators said that the delivery of contemporary teaching methodologies was hampered by limited access to digital equipment, and another 13% said that student absences made teaching even more difficult. When taken as a whole, these findings demonstrate the critical influence that infrastructure has on the viability of post-pandemic teaching strategies.

Significant geographical differences in the adoption of blended learning approaches were found by the study's research. Thanks to reliable energy and fast internet, urban schools were able to continue and grow their use of technology-enhanced instruction. In order to support both synchronous and asynchronous education, 89% of urban educators continued to

use blended learning methodologies, utilizing resources like Zoom, Google Classroom, and other learning management systems. These schools supported the transition to student-centered learning by incorporating interactive technologies, such as digital simulations and virtual labs, into the curriculum. Teachers were better able to track students' progress because of the usage of interactive whiteboards, online tests, and digital collaborative platforms, which also increased engagement and gave instant feedback.

In contrast, blended learning adoption rates were lower in rural and interior schools, where 21% of teachers completely returned to pre-pandemic, lecture-based approaches and just 46% of rural educators maintained partial integration of post-pandemic methodologies. Due to restricted access to digital tools, unstable electricity, and poor internet connectivity, 79% of educators in rural regions still mostly use conventional direct instruction. Just 18% of teachers in these areas used learner-centered approaches like inquiry-based and collaborative learning. This glaring disparity between interior and urban schools illustrates how structural injustices influenced the adoption and persistence of creative teaching methods.

These results were supported by statistical analyses. The results of a chi-square test ( $\chi^2 = 15.32$ ,  $p < 0.01$ ) showed a substantial correlation between geographic location and the ongoing use of blended learning, demonstrating that teachers in urban areas were far more likely to use technology-enhanced instruction than those in rural and interior areas. The main predictors of sustained adoption, according to regression studies, were internet connectivity ( $\beta = 0.35$ ,  $p < 0.05$ ) and electrical reliability ( $\beta = 0.42$ ,  $p < 0.05$ ), while student attendance and device access had relatively lower predictive values. The structural obstacles inhibiting the complete implementation of post-pandemic teaching strategies in underdeveloped areas are statistically illustrated by these findings.

The results also showed significant regional variations in teaching strategies. In urban schools, 18% of teachers used inquiry-based learning tactics, 5% used collaborative project-

based methods, and 27% of teachers permanently adopted flipped classroom models. This change signifies a significant departure from the teacher-centered, primarily lecture-based method that defined instruction prior to the pandemic. However, these cutting-edge teaching techniques were much less common in rural and interior schools, where most teachers resorted to traditional techniques that mostly relied on textbooks, handwritten notes, and oral instruction. While radio broadcasts, printed worksheets, and pre-recorded audio courses were employed as offline options to augment education, they constrained the potential for student-centered and participatory learning.

All things considered, the analysis of the data shows that the pandemic hastened the adoption of contemporary, student-centered teaching strategies in locations with dependable infrastructure, while emphasizing the continued use of conventional approaches in rural and interior regions. The differences highlight how crucial internet access and electricity are in determining teachers' capacity to continue using blended and interactive learning strategies after the pandemic. Additionally, these findings support the findings from RQ1, reaffirming that teacher readiness and access to digital resources are essential for maintaining educational innovation.

These findings imply that rural and interior schools are unlikely to catch up to urban schools in terms of teaching methods and student involvement unless focused measures are implemented to alleviate infrastructure disparities. Supporting the long-term incorporation of interactive and blended learning approaches requires investments in dependable electricity, internet connectivity, and access to digital learning resources. Furthermore, professional development initiatives that are customized to the particular difficulties faced by each area may be able to assist teachers in overcoming infrastructure constraints and making the most of the resources that are available. Overall, the assessment highlights that spatial differences still influence educational results in Guyana and that institutional changes are required to

guarantee that all areas have fair access to contemporary teaching techniques.

The assessment of the *third research question* looked at how student performance on the Caribbean Secondary Education Certificate (CSEC) exams has changed as a result of teachers' changing roles. In Guyana's education sector, the results from 2019 to 2023 showed a clear difference in performance trends between Queen's College, St. Roses High, and Charity Secondary School. These findings reflected broader systemic changes in teaching methods, digital adaptation, and post-pandemic recovery. The information showed that Charity Secondary School saw a steep drop in matriculation rates over the course of the five-year period, leading to a notable performance disparity by 2023, whilst Queen's College and St. Roses High continuously maintained high matriculation rates.

Thus, this assessment places these results in the framework of evolving teaching methods, teacher readiness, digital tools, and psychological circumstances that influenced the way education was delivered both during and after the pandemic. Teachers had to traverse unexplored pedagogical territory as a result of the pandemic's acceleration of a global restructuring of educational responsibilities. This change took place in Guyana against a backdrop of insufficient digital resources and inconsistent teacher preparation. Suddenly, and frequently without sufficient training, teachers were expected to take on the simultaneous responsibilities of managing electronic platforms and facilitating learning. According to the statistics, academic results showed more continuity at institutions like Queen's College and St. Roses High that continued to provide online courses during lockdowns. Through hybrid methods of continuous evaluation, consistent student involvement, and regulated scheduling, their teachers adjusted to teaching in virtual classrooms.

Learning loss was lessened by the improved instructional efficacy brought about by the more familiarity with digital learning environments. On the other hand, Charity Secondary's sharp drop in matriculation rates illustrated the effects of an ineffective

transitioning educational system. This school's poor administrative coordination, limited training opportunities, and unreliable digital infrastructure demonstrated how systemic injustices exacerbated educational difficulties. Thus, the results supported the claim that academic achievement during this time period was more a reflection of teacher flexibility and institutional preparedness than it was of student ability.

The time evolution of the data further demonstrated the impact of teacher adaptability on academic achievements outside of the acute crisis phase. When in-person education was resumed in 2021 and 2023, Queen's College and St. Roses High not only recovered but even outperformed their pre-pandemic performance levels. This implied that hybrid teaching strategies yielded long-term advantages when bolstered by digital literacy and professional development. Higher confidence levels, better content delivery through blended techniques, and more diversified assessment strategies were noted by teachers in these schools. On the other hand, Charity Secondary's inaction showed how poor performance was sustained in the absence of focused post-pandemic actions. The quality of education was directly hampered by the persistent exhaustion, high turnover, and emotional burnout experienced by teachers in areas with few resources.

Son et al. (2021) found that increased workload and teacher stress were important factors influencing job satisfaction and motivation. In a Guyanese setting, the association between teacher exhaustion and student underachievement at Charity Secondary confirmed these global findings and demonstrated that the teacher's developing position as a digital facilitator required ongoing institutional and emotional support systems.

Additionally, the qualitative observations were empirically supported by the regression analyses shown in Tables 7 through 12. Across the three schools, the R-square and ANOVA results showed statistically significant correlations between student outcomes, teacher workload, and teaching modality. Better performance indicators were associated with

higher amounts of organized digital interaction. The model coefficients demonstrated that matriculation rates were positively impacted by teacher-led efforts in digital integration.

These quantitative trends corroborated the idea that the redefining of teaching roles had a transformative rather than situational impact on academic attainment. These findings, however, also demonstrated how persistent the digital divide is: instructional innovation was scarce in schools without access to dependable connectivity or qualified personnel. Thus, the research confirms that although shifting teaching roles sparked pedagogical development, their efficacy depended on professional and infrastructure capabilities.

The psychological and emotional effects of these changes on educators and students constituted a supplementary feature of the findings. According to Kecojevic et al. (2020) and Xie et al. (2020), academic instability was associated with increased anxiety and cognitive exhaustion, highlighting the unexpected pressures brought about by the sudden change to online and hybrid modalities. Many educators in Guyana, especially those in lower-performing schools, lacked the psychosocial skills necessary to recognize and address student distress. Teachers were under additional pressure to "catch up" on missed curricula, which exacerbated this gap and shifted their emphasis from formative interaction to subject completion. On the other hand, institutions such as Queen's College put in place internal support systems, such as peer mentorship and online counseling programmes, which helped students stay motivated and less distressed.

These variations demonstrated how educators' roles have evolved to include pastoral care and emotional management in addition to teaching, a change that has a noticeable impact on CSEC results. Additionally, the pandemic forced a reconsideration of assessment procedures. Institutions that used a variety of assessment methods performed better in preserving performance consistency, according to the results. Academic continuity was preserved by schools that implemented digital mock exams, project-based evaluations, and

formative assessments. On the other hand, schools that rigorously followed traditional summative evaluations using pen and paper found it difficult to accurately gauge student learning during disruptions. A key idea in this study was the significance of flexible evaluation systems in maintaining equity during remote learning, as highlighted by Williams and Wong (2020).

However, national examination requirements that valued uniformity over contextual flexibility continued to place restrictions on Guyana's educational system. The findings showed that pupils benefited from more genuine assessments of competency in situations when teachers had little discretion to alter evaluation protocols. Therefore, institutional rigidity simultaneously empowered and limited the developing role of teachers as assessors, a paradox that influenced disparate performance outcomes among schools.

Professional development for teachers was found to be another important factor. The results verified that teachers who were specifically trained in digital pedagogy during the pandemic performed better in their post-pandemic lessons.

Despite being dispersed unevenly, Ministry of Education initiatives were helpful in schools that fully adopted them. Educators who received training on how to incorporate digital resources into lesson planning and assessment demonstrated increased flexibility and self-assurance. The Guyanese case supported Picciano's (2020) argument that ongoing digital upskilling is necessary in the post-pandemic educational environment. Educators who had access to training on digital pedagogy and online learning management systems showed higher levels of classroom engagement, which in turn improved student accomplishment. The statistics showed a three-tiered educational system split along technological, geographic, and socioeconomic lines; on the other hand, the absence of such chances in coastal schools with fewer resources and those in the hinterland solidified gaps.

Systemic flaws in institutional support and policy coherence were also revealed by the review. National policy direction lags behind the development of internal frameworks for hybrid learning by high-performing schools. Strong educational systems that can foresee and react to crises through adaptable policies are essential, according to Burns and Diamond (2020). The change in the roles of teachers was primarily reactive rather than deliberate because Guyana's educational system lacked contingency planning. Instead of putting systematic educational reform into practice, teachers started to improvise. The sustainability of innovation was hampered by this reactive approach, particularly in institutions with no leadership capable of instituting adaptive procedures.

The ramifications are significant: the pedagogical advances of the pandemic period run the risk of being undermined in the absence of institutional methods to incorporate hybrid teaching competencies into systems for teacher evaluation and promotion. The findings also included an interpretive thread about the significance of institutional culture and teamwork. The adoption of new teaching modalities was more smoothly implemented in schools that supported professional learning communities. Peer observation, cooperative problem-solving, and shared lesson planning fostered a supportive environment that lessened the loneliness that remote teaching frequently brings. This was demonstrated by Queen's College's teacher mentorship program, in which seasoned educators assisted more junior colleagues in creating digital courses. The fragmented method of Charity Secondary, where educators worked in silos with no administrative coordination, stood in sharp contrast to this collective concept.

The findings showed that institutional culture was just as important to the durability of shifting teaching positions as individual competence. While isolation solidified stagnation, collaboration boosted innovation a dynamic that directly affects student achievement. The assessment found socioeconomic characteristics to be important mediators in the relationship

between teaching positions and student performance, in addition to institutional variables. Compounded disadvantages for students from lower-income homes included reduced parental supervision during remote learning, erratic internet connectivity, and restricted device access. In these situations, teachers took on compensatory responsibilities such as resource mobilization, counseling, and one-on-one tutoring. Although admirable, these extra duties made teacher fatigue worse. Thus, the results showed a systemic injustice in which educators who worked with underprivileged groups were disproportionately burdened without receiving the same level of institutional assistance.

Their ability to continue providing high-quality education thus deteriorated over time, which added to the ongoing performance disparity seen in the CSEC findings. The statistical studies supported the validity of these findings from a methodological standpoint. The assertion that teacher adaptation had a direct impact on student performance was given empirical support by the consistency of regression coefficients across models and the significant levels shown in the ANOVA tables. Despite being moderate, the coefficient magnitudes showed a significant correlation between matriculation rates and professional development characteristics. These findings supported Naser and Sha's (2021) finding that, if institutionalized through policy, post-pandemic reforms could promote long-term educational resilience. However, the Guyanese case showed that innovation without equity results in unequal advantages.

Therefore, the issue is to transform teachers' individual adaptability into systemic change by making consistent investments in digital infrastructure and capacity training. The assessment comes to the conclusion that Guyana's educational transition has been both accelerated and reflected in the evolving role of teachers. The pandemic acted as a catalyst, revealing weaknesses while simultaneously encouraging innovative approaches to teaching.

While schools limited by a lack of resources and administrative lethargy fell behind, others that embraced hybridization, collaboration, and continual learning grew stronger.

Together, the results confirm that, during periods of systemic upheaval, teacher flexibility continues to be the most important factor influencing student achievement. But without institutional scaffolding—rules, training, and emotional support—that acknowledge teachers as both change agents and change targets, adaptation cannot be maintained. Thus, the information from Queen's College, St. Roses High, and Charity Secondary captures a microcosm of Guyana's larger educational environment, which is marked by inequity, resilience, and the pressing need for structural change to match teaching positions with the changing needs of the classroom in the twenty-first century.

The *fourth research question* focused on students' opinions regarding modifications to traditional teaching techniques prior to, during, and following the pandemic. Using standardized questionnaires, the study collected 183 replies, 154 (84.2%) of which were valid and showed discernible improvements in teaching strategies, whereas 15.8% (39 responses) did not see any such changes. According to these results, a sizable majority of students acknowledged that teaching methods had changed since the pandemic, while opinions on how advantageous these changes were differed widely. Even though the majority of the questions used in the research were closed-ended Yes/No questions, significant trends in the experiences of the students showed how pedagogical modifications had a complex effect on learning results.

The findings show that while integrating digital tools allowed for greater flexibility in instruction, their efficacy was mostly dependent on the teachers' technological proficiency and pedagogical expertise. Group projects, tests, and virtual simulations are examples of interactive tactics that have been repeatedly evaluated as being more successful than passive slide shows. Students expressed increased interest in science and Caribbean history, for

example, and the utilization of multimedia and interactive learning materials made significant historical events easier to understand. On the other hand, 36 students (20%) said that an excessive dependence on online resources diminished the chance for genuine interaction with teachers, which resulted in less customization and a feeling of disengagement in certain classrooms. These results imply that although digital platforms have the potential to improve learning, inappropriate or overuse of them may unintentionally reduce student engagement.

This two-fold effect of technology integration aligns with earlier studies on digital and mixed learning. According to UNICEF (2020), while online and hybrid models might help maintain continuity in times of crisis, they can also make it more difficult for teachers and students to communicate. In a similar vein, Pellegrino and Hilton (2012) contended that although interactive, student-centered learning encourages critical thinking and self-directed learning, if done poorly, it may encourage passive information consumption. The idea that sudden shifts to digital learning, as required by the pandemic, interfered with students' capacity to focus is further supported by studies by Kecojevic et al. (2020) and Xie et al. (2020). This is primarily because there were fewer possibilities for students to interact directly with their teachers. These results put the experiences that Guyanese students shared into context. Many of them encountered irregularities in the way that their education was delivered, which affected how they saw the advantages of digital tools.

Students' choices for these new approaches were more mixed, even though it was widely acknowledged that teaching methods had changed. While 51% of respondents either preferred traditional tactics or saw little difference in their learning experience, just 49% of respondents said they preferred the post-pandemic teaching methods. This discrepancy shows that although blended learning was widely accepted, the advantages were not equally felt by all. It emphasizes how important teachers' technological and pedagogical skills are in influencing how successful digital tactics are. The success of digital education depends not

only on having access to technology but also on the caliber of interactions between teachers and students, which seems to have differed between the schools in this study, according to OECD (2021) and Selwyn (2020). Accordingly, the evidence indicates that technology by itself does not ensure better learning results; rather, its efficacy depends on its careful incorporation into pedagogically competent teaching strategies.

Additionally, the data shows that while blended learning was difficult for some students, it had a favorable impact on academic engagement for others, which reflects larger systemic problems. According to Dowling et al. (2003), hybrid models have been shown to improve academic achievement, especially for female students. This suggests that there are measurable advantages to carefully integrating digital technologies. However, putting these concepts into practice consistently presented major challenges for Guyana's educational system. Wide variations in teacher readiness, resource accessibility, and expertise with online teaching methods resulted in uneven student experiences and, occasionally, a drop in performance. Furthermore, as noted by Kecojevic et al. (2020) and Xie et al. (2020), the pandemic placed additional burdens on educators and pupils, potentially influencing academic results.

The results of the study further highlight how crucial Technical Pedagogical Content Knowledge (TPACK) is to successful training in hybrid settings (Mishra & Koehler, 2006). When used effectively, blended learning models promote self-directed learning, critical thinking, and problem-solving (Pellegrino & Hilton, 2012), and technology tools like virtual laboratories improve student engagement and academic achievement (Kay, 2012; Biswas et al., 2014). However, issues including unequal device distribution, erratic internet access, and inconsistent instructor technological proficiency persisted in impeding students' capacity to fully capitalize on these advancements. These elements also made monitoring and assistance more difficult, raising the possibility of student distraction and disparities in performance.

The results show that the pandemic significantly changed secondary school instruction in Guyana, causing a move toward blended learning that integrated digital and traditional teaching strategies. Flexibility and inclusivity were enhanced by this change, especially for students who struggled academically or had restricted internet access. Communication and participation were improved by online learning tools like Moodle and Google Classroom, particularly in courses like Caribbean history that previously mostly relied on lecture-based instruction. However, the shift was not uniformly executed, and the quality of teacher preparation and the fair allocation of resources influenced students' experiences in addition to the availability of digital technologies.

Many students found that technology made learning more dynamic and interesting, but the success of these approaches hinged on institutional support, instructional design, and educator proficiency. Though their effectiveness necessitates close attention to pedagogical training, technology infrastructure, and methods that assure inclusivity and sustained engagement, the research generally confirms that post-pandemic teaching strategies in Guyana have the potential to improve student learning results.

The assessment of the results for *research question five* revealed that a mix of pedagogical innovation, technological advancement, and institutional constraints characterized the post-pandemic educational environment in Guyana's secondary schools. The findings indicated a clear preference for flexible and blended learning approaches, but these were applied in institutional settings that were frequently unprepared to support these changes. Teachers and children agreed that the pandemic had sped up digital adaptation, but institutional change, not teacher effort, was necessary for these strategies to be successful in the long run.

The results showed a definite preference for project-based and interactive learning strategies, which encouraged student collaboration, critical thinking, and active engagement.

This change reflected a structural growth in teaching philosophy rather than just a choice among educators. Long ingrained in Caribbean education, the traditional teacher-centered paradigm has failed to sustain student engagement and information retention both before and after the pandemic. The demands made by students for improved communication, prompt feedback, and more engaging education highlighted institutional weaknesses in teacher support and assessment design. These shortcomings, which reflected the lack of uniform systems for quality control and instructional monitoring across schools, were systemic rather than just pedagogical.

In an analogous way, a structural issue in the educational system was highlighted by teachers' emphasis on professional development and capacity building for hybrid and digital instruction. According to the findings, teachers were open to incorporating technology into their lessons, but they lacked the tools, digital competence, and institutional support needed to do so successfully. Students' experiences of unequal digital support and educators' training requirements were correlated, highlighting a larger systemic problem: the continuation of infrastructural inequality. Disparities in educational performance resulted from the clear disadvantage faced by schools with insufficient technical capacity. Therefore, intentional investments in teacher preparation, resource distribution, and technology-driven curriculum development were required as part of the post-pandemic reform agenda in order to overcome these disparities.

The harmony between digital innovation and cognitive health was another important theme that surfaced. The findings showed that although technology has made learning more flexible, students' weariness and lack of focus were caused by uncontrolled screen time and poorly planned digital interaction. This research implied that a comprehensive framework including digital health, instructional design, and classroom management techniques was necessary for successful post-pandemic schooling. In addition to having technical abilities,

teachers also required to be able to handle the psychological effects of extended technology use. This aspect of the results showed how pedagogy and mental health are intertwined, highlighting how crucial it is to preserve the human element in technology-mediated learning.

The assessment also emphasized how urgently the curriculum needs to be updated. A structural mismatch between the current curriculum and the realities of modern learning contexts was reflected in the teachers' calls for reform. The inflexibility of an antiquated curriculum that neglected to incorporate digital competencies, flexible evaluation, and interdisciplinary problem-solving was made clear by the pandemic. More relevance and responsiveness to the changing educational landscape would have been guaranteed by a revised curriculum that supported digital fluency and was in line with hybrid teaching paradigms.

When combined, these results showed that separate efforts were insufficient to bring about post-pandemic reform. The issues found were systemic in nature and linked, ranging from poor teacher training to a lackluster digital infrastructure. Coordination of policy initiatives that enhanced institutional capacity, updated curricula, and encouraged equitable access to technology resources were necessary for an effective transition. In addition to revealing underlying institutional inefficiencies, the pandemic acted as a diagnostic moment and a spur for change.

The assessment of Research Question Five essentially showed that Guyana's secondary education system had been at a turning point. In order to maintain learning continuity, technology, pedagogy, and policy would need to work together in the future, according to the lessons learnt during the pandemic. The post-pandemic education system might develop into one that was more robust, equitable, and in line with the needs of the twenty-first century by incorporating structural reforms that increased digital access, empowered teachers, and supported adaptive learning frameworks.

**Significant changes in teaching strategies were brought about by the COVID-19 pandemic**, and these changes had a direct impact on students' learning results, especially in settings with a lack of resources. With educators using digital tools, virtual learning platforms, and multimedia materials to create dynamic and captivating learning environments, technology adoption has become a key component of educational adaptation. In cities with dependable internet connectivity, hybrid models that combine online and in-person training have become popular. Teachers in remote areas with little infrastructure, however, had to rely on other techniques like printed worksheets and television and radio broadcasts. As educators moved from being information suppliers to facilitating interactive learning, these modifications highlighted a change in pedagogical responsibilities that required professional development in digital and remote teaching.

These modifications had a complex effect on the learning results of the students. Hybrid methods and technology integration increased student engagement and sustained excellent academic achievement in well-resourced schools. Schools such as Queen's College and St. Roses High School, for example, had high CSEC matriculation rates both during and after the pandemic; in 2023, Queen's College achieved 99.15%. In a similar vein, engaging teaching strategies raised student interest in courses like Caribbean history and boosted enrollment. On the other hand, there were significant interruptions at schools like Charity Secondary School which were located in underdeveloped communities. Inadequate teacher preparation, erratic internet connectivity, and restricted device access led to subpar academic results, such as a 0% matriculation rate in 2021 and just 11.6% in 2023.

The digital gap was made worse by geographic differences in resources, which increased learning result discrepancies. While students in metropolitan centers benefitted from ongoing technology integration, individuals in rural regions encountered substantial obstacles while trying to attend online education. Academic performance was further hampered by the

pandemic's effects on students' mental health, which included elevated stress and diminished motivation. These difficulties were also exacerbated by some students' resistance to digital learning since they preferred conventional in-person instruction.

In the end, a clear disparity in educational achievements according to resource availability was exposed by the pandemic-induced alterations in teaching methodologies. Schools in underprivileged locations found it difficult to minimize interruptions, whereas those with strong infrastructure effectively transitioned to hybrid models, preserving or enhancing student performance. This disparity emphasizes how important it is to provide equal access to technology, training for teachers, and mental health services to guarantee that educational systems are resilient in times of crisis.

#### **4.5 Summary**

Global education systems faced previously unheard-of difficulties as a result of the COVID-19 pandemic, which accelerated the transition from traditional in-person instruction to online and hybrid learning. This shift in Guyana brought to light and deepened already-existing inequalities in educational resources, especially between urban and rural regions. This research looks at how teachers changed their teaching strategies throughout the pandemic, evaluates how these adjustments affected students' performance, and investigates the structural issues with Guyana's educational system. The research highlights important patterns and outcomes by analyzing data from surveys of 54 educators, and 183 students, and interviews were done with 15 senior teachers of the identified High Schools. It also analyzes the results of the Caribbean Secondary Education Certificate (CSEC) from 2019 to 2023.

The switch from traditional in-person training to online and hybrid learning modes was one of the biggest changes during the pandemic. The necessity to preserve instructional continuity in the face of massive school closures prompted this adjustment. The study found

that 57.4% of educators who participated said that digital technologies including online simulations, multimedia materials, and virtual assistants were essential to their capacity to instruct during this period. With the use of these resources, educators were able to design dynamic and captivating classes, which was a change from the passive, lecture-based teaching strategies that were popular before the pandemic.

While not completely unprecedented, the rapid adoption of digital technology highlighted a trend that was already gaining traction before the crisis. However, the pandemic's urgency accelerated this development, requiring teachers to become proficient with digital tools and internet platforms. This change also necessitated a thorough reassessment of teaching strategies. Educators shifted to student-centered teaching strategies that prioritized cooperation, critical thinking, and active participation. This supports long-standing demands in educational literature for a shift from passive learning to more dynamic, interactive methods, including those made by Jaques (1992) and McCarthy & Anderson (2000).

Significant differences in access to educational resources exist throughout Guyana's regions, according to the report, especially between more rural locations like the Interior Savannah and Forested Highlands and more urbanized areas like the Low Coastal Plain. In general, metropolitan teachers have easier access to digital tools, dependable internet, and other resources that are necessary for online education. On the other hand, teachers in rural regions encountered significant obstacles, such as sporadic electrical supplies and restricted internet access. For instance, 48.1% of rural respondents named unstable energy as a significant barrier, while 13% of them mentioned inadequate internet connectivity as a crucial concern.

The country's topography added to these difficulties by making it challenging to set up and maintain communication networks in isolated locations. Schools in remote areas came up

with innovative ways to deal with these problems, such as using the postal service to provide printed educational materials and using television and radio broadcasts to reach students who couldn't access the internet. The study revealed that rural regions' educational quality declined dramatically despite these efforts, highlighting the ongoing digital gap in Guyana's educational system.

Students' performance on the Caribbean Secondary School Certificate (CSEC) exams, a crucial secondary school milestone, showed the consequences of these differences in a glaring manner. Significant variations in matriculation rates were seen between 2019 and 2023 in data from Queen's College, St. Roses High School, and Charity Secondary School. With a matriculation rate of 99.15% in 2023, Queen's College, an urban institution with greater access to resources, continuously maintained outstanding performance. The matriculation rate at Charity Secondary School, which is situated in a rural location, on the other hand, had a sharp reduction, falling to 0% in 2021 and only slightly increasing to 11.6% in 2023.

These differences demonstrate the wider difficulties that Guyana's educational system encountered during the pandemic. While rural schools found it difficult to deliver the same level of instruction, urban schools, which had access to strong infrastructure and digital resources, were better able to adjust to distant learning. The results are consistent with worldwide patterns reported in studies by Hodges et al. (2020) and Xie et al. (2020), which highlight the strain and challenges that teachers and students have while switching to online instruction.

Additionally, the pandemic hastened the introduction of blended learning models, which combine digital and online methods with conventional in-person training. 154 out of 183 student participants in the survey said that they would prefer blended learning in the future, demonstrating the high support that educators and students have for this hybrid

paradigm. This change reflects a growing understanding of the advantages of fusing the flexibility and accessibility of online learning with the structure and support of in-person instruction.

Blended learning has many benefits, especially in this period of ongoing uncertainty. It gives students more freedom to balance their coursework and other obligations, and it allows teachers to use various teaching methods and materials. However, there are some obstacles to the effective adoption of blended learning in Guyana, including uneven access to technology and disparities in teachers' levels of digital literacy. One of the biggest challenges to successfully adopting blended learning is the digital divide. When compared to their urban counterparts, students in distant locations are at a major disadvantage since they frequently do not have access to the gadgets and internet connectivity required for online learning. Similar to this, a lack of training and support makes it difficult for many educators, especially those in rural areas, to adopt new technology.

The study highlighted the necessity of continual professional development for teachers to improve their pedagogical and digital literacy. The main goal of training programmes should be to provide educators with the skills and techniques they need to successfully incorporate technology into their lesson plans. Targeted interventions are also needed to address the resource inequalities that prevent blended learning from being implemented fairly throughout Guyana.

The pandemic brought attention to how important inclusive education is, especially for children who have limited access to technology or impairments. According to the report, the crisis made already-existing disparities in the educational system worse, highlighting the need for more inclusive teaching and learning methods. Similar to this, UNICEF (2020) has underlined how crucial it is to guarantee all students, regardless of their circumstances, fair access to high-quality education.

Prioritizing the needs of underprivileged students and giving them the tools and assistance they need to achieve should be the main goal of inclusive education initiatives. This entails making infrastructural investments, increasing access to digital resources, and creating curricula that cater to a range of learning requirements. Notwithstanding the difficulties, the pandemic offered chances for creative teaching and learning methods. To make learning more relevant and interesting, educators were forced to try out novel strategies, such as using real-world examples in their classes. In addition to raising student involvement, this method assisted in preparing them to use their knowledge and abilities in practical settings.

The pandemic offered teachers both special opportunities to innovate and enhance their teaching strategies as well as substantial hurdles. The need for clear communication and robust student assistance during the shift to online learning was one of the major issues the study uncovered. Students underlined the value of regular and open contact with their professors in addition to having access to integrated learning tools. These components played a critical role in keeping students motivated and engaged throughout a challenging and uncertain period.

Teachers, on the other hand, emphasized the significance of adaptive assessment techniques and the necessity of continual professional growth. Teachers have to reconsider their assessment methods in light of the move to online learning and come up with fresh approaches to impartially and properly assess student performance. It was also crucial to use adaptive assessment techniques, which consider each student's situation, to make sure that every student has the chance to achieve.

The pandemic also brought to light the significance of implementing a real-world curriculum, which entails relating what is learned in the classroom to problems and experiences encountered in the real world. This method not only increases student

involvement but also gets them ready for using their knowledge and abilities in the real world. According to the research, a lot of teachers in Guyana used the pandemic as a chance to add more real-world examples to their lessons, which helped the students understand how important education was for their lives outside of the classroom.

The pandemic also brought attention to the necessity of increased cooperation among teachers. According to the study, educators were better able to deal with the difficulties of online learning when they could work together with their peers and exchange resources and tactics. This research emphasizes how crucial it is for educators to establish robust professional networks and communities of practice within and between schools. The COVID-19 pandemic has had a significant effect on Guyana's educational system, requiring teachers to adjust to new teaching methods and drawing attention to already-existing disparities in student access to resources. This study has made clear how Guyana's teachers changed their teaching strategies throughout the pandemic and the impact these changes had on their students' academic achievement. The findings highlight the need for concentrated efforts to narrow the digital divide and ensure that every child, wherever they may live, has access to a top-notch education.

Several suggestions for future practice and policy may be made in light of the study's findings. Teachers must first get continual professional development and assistance to meet the challenges posed by online and blended learning. Training in inclusive education techniques, adaptive assessment techniques, and digital literacy are a few examples of this. Secondly, to close the digital gap and guarantee that every student has access to the tools they require for success, there is a need for focused investments in technology and infrastructure. To exchange resources and methods and create strong professional networks, educators must work together more and communicate with one another both within and outside of classrooms.

A turning point in Guyana's educational history, the COVID-19 pandemic revealed long-standing injustices and forced teachers to adjust to previously unheard-of difficulties. Although there were many challenges associated with the shift to online and hybrid learning, it also brought attention to the possibilities of blended learning models and allowed for the development of creative teaching strategies. To create a more resilient and equitable educational system, it was essential to address the differences in resource availability and offer assistance to teachers and students.

The results of this study demonstrated how important resources and services for student assistance are in creating a positive learning environment. Some important themes surfaced from the data analysis, highlighting the need for a more adaptable and inclusive approach to education. These themes include the difficulties of digital learning, the necessity for educator leadership, and accommodations for different learning speeds. Every one of these discoveries advances our knowledge of how teachers may improve learning outcomes and student experiences.

The stated need for more teacher guidance is among the most important results. Many students said that to comprehend and meet their learning objectives, they need more active help from their professors. Some students need extra help mastering complicated subject matter and have trouble recognizing important curricular goals. This result is consistent with other studies on the value of organized instructional assistance in fostering student achievement. It recommends that educators take a more active role in helping students understand their academic objectives and stay motivated by providing focused advice.

The necessity of accommodating different learning speeds is another noteworthy issue. According to the survey, students who are getting ready for the CSEC examinations place a special emphasis on the value of adaptable teaching strategies. Rigid teaching methods may prevent some students from successfully understanding key ideas since

different students learn at different rates. According to the results, using diversified instruction strategies—like customized learning plans, adaptive teaching approaches, and a variety of evaluation techniques—could greatly raise student performance. This is in line with pedagogical ideas that support student-centered learning, in which teaching strategies are tailored to each learner's unique requirements to optimize understanding and retention.

Additionally, difficulties with digital learning became a significant problem. Although most students agree that online learning is convenient and accessible, they also point out a number of disadvantages. Long periods of screen time and the absence of interactive components in online courses are two of the most commonly mentioned issues. Both general well-being and student involvement are impacted by these issues. According to the results, these issues may be lessened and the efficacy of online learning increased by implementing blended learning strategies, interactive digital tools, and scheduled breaks. This bolsters the body of research on the effects of digital weariness and emphasizes the necessity of well-rounded, thoughtfully created online learning environments.

All things considered, the information points to the need for teachers to embrace a more flexible and inclusive teaching style. The results highlight the value of specialized support networks that successfully manage students' diverse demands while facilitating their digital learning experiences. Educational institutions may establish a more encouraging and productive learning atmosphere by implementing more practical instruction, adjusting for varying learning speeds, and improving digital teaching techniques. To further enhance academic results, future studies should look into other strategies for maximizing student support services and how these conclusions may be used in other educational contexts.

## CHAPTER 5: IMPLICATIONS, RECOMMENDATIONS, AND CONCLUSIONS

The COVID-19 pandemic that began in 2020 caused havoc in almost every area of life, with education being one of the worst-damaged industries. Guyana's distinct geographic and sociopolitical makeup meant that the pandemic's effects on schooling were especially severe and unique in that nation. These many causes contributed to the wide variation in learning loss that was seen throughout the country. The centralized nature of Guyana's Presidential Parliamentary system, in contrast to federal systems in other nations, has made learning loss inequities worse. This resulted in a scenario where many children were left behind academically and alienated, particularly in outlying regions.

The school system in Guyana progressively resumed traditional classroom activities as the pandemic started to fade. Schools resumed at the end of 2021, and in-person instruction was largely restored by 2022. But going back to conventional classroom settings does not entail going back to the ways of teaching that existed before the pandemic. Many teachers returned to their classrooms having developed new technology abilities during the virtual education period, which they started implementing into their lesson plans. This study aims to investigate how much of these innovative teaching methods—which emerged during the pandemic as a matter of necessity—have been incorporated into Guyana's post-pandemic educational system. The study's specific goal is to ascertain if educators have gone back to the conventional "chalk and talk" technique or have combined it with more contemporary technology strategies to enhance the learning experience of students.

Using both quantitative and qualitative data, a mixed-methods technique was used to accomplish the study objectives. The matriculation rates of Queen's College, St. Roses' High School, and Charity Secondary School—three prestigious secondary schools in Guyana—were examined as part of the study's quantitative component. The percentage of students that pass at least five courses at the Caribbean Secondary Education Certificate (CSEC) level,

including English and mathematics with grades 1-3, is known as the matriculation rate, and it is a crucial indication of academic performance in Guyana. The study looked at matriculation rates from 2019 to 2023, which includes the years prior to, during, and following the pandemic, in order to determine whether the change in teaching strategies had a notable impact on student performance.

Teachers and students alike completed questionnaires to provide qualitative data in addition to the quantitative data. The survey was completed by 54 teachers and 183 students from the three schools. These surveys were made to learn more about the modifications in instruction that teachers made both during and after the pandemic, as well as how they felt it affected students' performance. Interviews with fifteen senior teachers were conducted in-depth, which enhanced the qualitative component. These educators were chosen because of their twin responsibilities for curriculum implementation and school administration, which made them important sources of information on the adaptation tactics used during the pandemic and their efficacy in the aftermath.

The information gathered via surveys and interviews was thoroughly examined. The Statistical Package for the Social Sciences (SPSS) was used to analyze quantitative data, including matriculation rates, over a five-year period in order to identify trends and patterns. Thematic analysis was used to look at the qualitative information gathered from the interviews and open-ended survey questions. By employing this technique, the researcher was able to find narratives and recurrent themes regarding the changes in teaching methods and their effects.

This research was not without difficulties to conduct. Significant logistical challenges were given by Guyana's large and diverse landscape, especially when it came to data collecting. Despite having a tiny population, Guyana has a large geographical area, with some of its regions being quite inaccessible and challenging to reach. This was especially true for Charity

Secondary School, where follow-ups and regular inspections were difficult and expensive due to the school's remote location and inadequate infrastructure. Communication and data gathering operations were made more difficult by the sometimes erratic internet access in these rural places. Because of this, data collection had to happen in a limited amount of time, which somewhat restricted the study's scope. The teachers' industrial action during the study period presented another significant obstacle. The regular operation of schools was disturbed by strikes and work stoppages, which made it challenging to keep in regular communication with both teachers and students. Due to this, data collection was delayed, and several follow-up attempts were required to make sure that enough data were collected. Even though the study's enrollment goal was 300 students, these and other limitations ultimately prevented 117 students from taking part, thus the number of participants in the study was 183. Throughout the whole study process, ethical considerations were paramount. To preserve each participant's privacy and anonymity, no identities were documented throughout the data collection procedure. By signing consent forms, teachers and students attested to their complete understanding of the study's objectives and their role in it. Participants also have the option to withdraw from the study at any time without incurring any penalties. The integrity of the study as well as the rights and privacy of the participants were safeguarded by these measures.

This chapter explores how the study's conclusions may affect Guyana's larger educational system. It examines the effects on students, educators, and other significant players in the education sector of the changes in teaching strategies following the pandemic. According to the research, a considerable proportion of educators have adopted a more hybrid approach, integrating technology to varied degrees in their classrooms, even if some have returned to more conventional teaching techniques. Student performance and engagement have been significantly impacted by this, with some students gaining from the more dynamic and

engaging learning settings that technology can offer.

The research's conclusions have some significant ramifications for Guyana's educational system going forward. First of all, they emphasize the necessity of teachers receiving continual professional development, especially in the field of educational technology. The pandemic has demonstrated that computer literacy is now necessary for modern, successful education and is no longer optional. Educational institutions and authorities must allocate resources towards teacher training programmes that enable them to effectively incorporate technology into their curriculum.

Second, the study emphasized how crucial infrastructure development is, especially in the nation's outlying regions. The difficulties in getting into institutions such as Charity Secondary School serve as a microcosm of the larger problem of unequal access to and possibilities for education in Guyana. Improving internet connectivity and other critical services in these underprivileged communities must be the government's top priority if it is to guarantee that all students have equitable access to high-quality education.

Finally, the study suggested that to better serve the needs of students from the post-pandemic generation, the curriculum may need to be changed. The pandemic has had a major impact on students' study habits, thus the educational system must also change. This might mean implementing more blended learning tactics, which provide students access to a more adaptable and comprehensive learning environment by combining traditional and digital teaching methods. It is also vital to reassess assessment methodologies to ensure that they are by the new teaching pedagogies and learning objectives.

In conclusion, the study clarified the significant alterations brought about by the COVID-19 pandemic in Guyana's educational system. Although there are still issues, especially about infrastructure and resource distribution, the pandemic has also given rise to chances for creative thinking and advancement in pedagogy. By expanding on the knowledge

gained during this time, Guyana's educational system were stronger, more resilient, and better able to serve the needs of all children going forward. The ultimate aim was to guarantee that every student has access to a top-notch education that would equip them for the future, irrespective of their socioeconomic background or place of residence.

## **5.1 Implications**

### **5.1.1 Theoretical Implications**

Constructivism, Connectivism, Transformational Leadership, and Socio-Cultural Theory, all of which offered a lens through which interpreted the long-term pedagogical changes brought about by the COVID-19 pandemic were the theoretical frameworks that guided the study, and the results of this research closely aligned with these frameworks.

From a constructivist standpoint, the shift to online and hybrid modalities gave teachers and students the opportunity to actively create information rather than passively absorb it. According to the constructivist method, learning is an active, contextual process in which people develop understanding via participation and introspection. Teachers in Guyana became facilitators who led pupils through inquiry, conversation, and digital exploration during the pandemic, rather of just imparting knowledge. Learning became dynamic and iterative with the usage of systems like Microsoft TEAMS, Zoom, and Google Classroom. As an example of how meaning was socially formed, students were encouraged to work together, ask questions, and look for resources outside of the classroom. With the help of suitable technology and professional flexibility, constructivist pedagogy might flourish even in times of crisis, as this reinterpretation of teacher and student roles showed.

The results also validated the ideas of connectivism, a philosophy that emphasized learning as a network-building and navigation process. Because educators and students rely on digital ecosystems for communication, collaboration, and information exchange, the

pandemic increased the importance of connection in education. Digital learning networks developed naturally in Guyana, where students accessed YouTube lessons, virtual labs, and interactive tests, while professors utilized WhatsApp groups to discuss assignments and announcements. Students were able to access a variety of knowledge sources and gain independence in assessing and using what they had learned thanks to these decentralized learning interactions. The connectivist theory that knowledge was dispersed throughout a network and that learning was the capacity to successfully navigate those connections was mirrored in this pattern. Crucially, educators who grew proficient in these new digital links became "knowledge nodes" in their organizations, guiding colleagues and fostering group development.

Teachers' adaptable duties during the pandemic were further clarified by the idea of transformational leadership. By expressing a vision, inspiring others, and encouraging innovation and dedication, transformational leaders spurred change. Despite the lack of infrastructure, many Guyanese educators took on this role in the classroom, frequently informally, by helping students navigate uncertainties, offering emotional support, and experimenting with digital tools. According to the study, schools that consistently practiced empathy, communication, and group problem-solving had higher learning continuity. This bolstered the claims made by Burns (1978) and Bass (1990) that transformational leaders were change agents who improved their followers' morality and motivation. A type of distributed leadership where both educators and pupils exercised agency and resilience was evidenced by teachers' capacity to innovate under duress.

In culminating the theoretical implications, a key framework for understanding how Guyanese communities maintained education in the face of disruption was offered by socio-cultural theory, especially Vygotsky's idea. Learning was socially integrated through the adoption of local cultural traditions, such as radio-based instruction, postal delivery of printed

packages, and the utilization of communal venues for small study groups. The social networks between parents, community leaders, and educators proved crucial in maintaining continuity despite technology constraints. One example of a socio-cultural response was the Guyana Learning Channel (GLC), which was a state-led adaptation of accessible media to keep learning within the linguistic and cultural context of the pupils. Together, these theoretical perspectives showed that rebuilding the connections, leadership styles, and social networks that enabled learning was just as important to education during the pandemic as adopting new technologies.

### **5.1.2 Conceptual Implications**

The results of this study highlight the value of data-driven approaches to address a range of educational difficulties and offer practical insights into how the pandemic has changed teaching and learning in Guyana.

With 57.4% of educators highlighting the use of digital tools, simulations, and multimedia resources in creating interactive learning environments, data from the 54 teacher surveys and 15 interviews indicates a significant trend toward the use of virtual assistants. This is consistent with research indicating that active, technology-enhanced instruction should replace passive lecture-based approaches (McCarthy & Anderson, 2000; Jaques, 1992). The substantial uptake of hybrid learning in coastal regions, which are home to more than 90% of high schools, emphasizes how easy access to online resources is in cities as opposed to rural areas, where conventional radio and television are still used because of inadequate infrastructure.

In Guyana, the geographical gap has a big influence on academic achievement. Due to interruptions and a lack of resources to effectively present the curriculum, schools in impoverished regions, including Charity Secondary, had a 0% CSEC matriculation rate in

2021. By using mixed tactics, urban institutions such as Queen's College, on the other hand, were able to attain continuously high matriculation rates, reaching a peak of 99.15% in 2023. This discrepancy emphasizes how urgently equitable resource distribution and infrastructure assistance are needed to close the educational gap, especially in rural regions.

Of the 154 genuine replies from students, 45.5% underlined the advantages of blended learning, while others emphasized the necessity of student assistance and clear communication. Notwithstanding the benefits, 48.1% of educators cited infrastructural problems, such as unstable electricity and inadequate internet access, as major obstacles to successful deployment. These results show that although students are aware of the promise of technology-enhanced learning, its wider success is constrained by inadequate infrastructure.

Rural schools were disproportionately impacted by pandemic-related interruptions, according to an examination of CSEC findings from 2019 to 2023. While online instruction helped urban schools maintain or enhance performance, Charity Secondary and other schools suffered steep drops. Disparities were made worse by the unequal integration of online platforms, which left rural students with more difficulties, such as a lack of devices and poor connectivity. This emphasizes the necessity of specialized approaches, such as legislative changes, to deal with these particular problems.

Many educators, especially those in rural areas, cited a lack of prior training and digital literacy as the main obstacles, reporting having trouble adjusting to hybrid teaching techniques. Sentance & Csizmadia (2017) also stress the importance of educators becoming proficient in technology-mediated education. Enhancing teacher efficacy and confidence in hybrid contexts requires training programmes that emphasize digital pedagogy and TPACK (Technological Pedagogical Content Knowledge) frameworks.

Continuous professional development is necessary to stay up with changing educational trends and technological advancements. Teachers can acquire certain abilities at

their own speed with the help of online courses and micro-credentials. Due to their lack of digital literacy, many educators find it difficult to make the switch to hybrid teaching. This gap should be filled by professional development that offers instruction beyond fundamental digital abilities. Programmes have to emphasize resources like multimedia integration and learning management systems (LMS), which let teachers design captivating online and hybrid courses. Teachers are better able to create engaging, student-centered settings when they prioritize these abilities.

A paradigm for successfully incorporating technology into instruction is offered by the TPACK framework. It makes sure that teachers utilize technology in a way that improves learning by coordinating it with pedagogical approaches and subject-matter expertise. Teachers' confidence and effectiveness are increased when they participate in training programmes that include TPACK, which teaches them how to use digital technologies in a meaningful way.

The information emphasizes how crucial it is to implement policies that promote infrastructure development, teacher preparation, and hybrid learning methods. As a stopgap measure, using radio broadcasts and classes that have already been recorded in underprivileged regions shows potential. Long-term plans, however, need to address the structural injustices that impede the provision of education in rural and isolated areas. The education sector in Guyana may be made more resilient and innovative by implementing policy changes that incorporate capacity-building programmes, infrastructural improvements, and adaptive assessment techniques.

There were a number of restrictions on the study that could have affected how the findings were interpreted. First, using self-reported information from surveys and interviews may add biases such as participant recalls that are not accurate or social desirability. Despite being varied, the sample size only consisted of 15 interviews and 54 educators, which might

not adequately represent the experiences and modifications in teaching made by all Guyanese educators. A mixed-methods strategy that combines self-reports with observational data or peer feedback was used to lessen this. Maintaining secrecy and anonymity promoted more truthful answers, and neutral, well-crafted questions reduced bias in data gathering. Additionally, because different participants had different access to resources and technology, the geographical variety of the participants made it difficult to standardize replies even while it guaranteed representation. By considering these variations, stratified sampling enabled more equitable representation and lessened the effect of regional inequalities.

By emphasizing the significant changes in teaching approaches made necessary by the pandemic and the difficulties presented by geographic and infrastructure inequalities in Guyana, the study's findings directly address the research topic. The results are in line with the goal of the study, which was to determine how teachers modified their methods of instruction and how this affected students' performance, especially on exams with high stakes like the CSEC. The focus on digital integration and blended learning shows a reaction to the changing needs of education in a technologically advanced age.

The findings are consistent with the conceptual framework, which highlights the shift from conventional teaching strategies to ones that are more participatory and technologically advanced. Theoretical foundations of contemporary pedagogical frameworks, including TPACK (Technological Pedagogical Content Knowledge), which support the smooth integration of technology with instructional tactics to improve learning outcomes, are reflected in the integration of digital tools and hybrid models.

By offering a region-specific examination of the pandemic's effects on schooling in Guyana, this research makes a substantial contribution to the body of current knowledge. In addition to highlighting particular difficulties such as infrastructure shortcomings and the digital divide in the Caribbean setting, it validates previous results from researchers like

Hodges et al. (2020), who recorded the global move toward online education. The findings further build on Sentance & Csizmadia's (2017) research by highlighting the real-world challenges of incorporating technology into the classroom without sufficient resources or training.

The findings were mostly in accordance with previous research, especially when it came to emphasizing the difficulties in switching to online and hybrid teaching styles. For instance, the study found that elevated stress levels among educators and students were a major factor influencing academic performance, which is consistent with findings by Kecojevic et al. (2020). However, one of the surprising findings was that, in contrast to worldwide trends favoring online learning, students in rural regions preferred conventional in-person teaching techniques. This disparity might be explained by Guyana's particular infrastructure issues, which worsen the digital divide. These issues include an unstable electricity supply and restricted access to digital devices.

The findings highlight the necessity of focused interventions for applied education practitioners to close the digital gap and provide fair access to resources in every area. Enhancing teacher confidence and preparedness requires professional development programmes that emphasize digital literacy and hybrid teaching techniques. To guarantee that every student benefits equally from technology developments in education, policymakers should also address the infrastructure limitations in rural regions.

This study deepened our understanding of how systemic issues, such as socioeconomic and regional inequality, affect the adoption of educational innovations in the context of doctoral-level research. By offering a sophisticated examination of the relationship between teaching strategies, student outcomes, and technology integration in a developing nation setting, it expands on the body of literature. Future studies investigating long-term educational changes and their effects on fairness and inclusion in post-pandemic educational

systems can build on the findings. The study's findings provide important light on the adaptation tactics used by Guyana's teachers both during and after the outbreak. The study illustrates the difficulties and possibilities for promoting educational fairness and innovation in the face of extraordinary disruptions by placing these findings within the larger body of literature and discussing their implications for practice and research.

## **5.2 Recommendations for application**

Through this study, the researcher would learn what long-term adjustments teachers would have made to create a more successful class and if most have stuck with the hybrid approach or gone back entirely to direct instruction methods. The study examines how teachers' teaching practices vary in Guyanese schools based on geographic and economic differences. This is because metropolitan schools require more time and resources than isolated locations in Guyana's forested Highland Regions. Additionally, the impact of these changing teaching philosophies on students' performance on regional exams—most notably, the CSEC exams that Grade 11 students throughout the Caribbean write—were examined. In order to better understand the effects of shifting teaching philosophies and how the Ministry of Education may create policies and initiatives to better support various teaching approaches, feedback from educators and students would also be gathered. In order for all Guyana students to fairly benefit from an improved education system, it is also necessary to ascertain which areas need more resources and how these resources were distributed. This would help our students' Universal Education programmes be more effectively supported when other nations in the Caribbean and Latin America face comparable challenges to Guyana.

The study's findings led to the formulation of the following recommendations, which aim to mitigate the pandemic's negative effects on education in Guyana's high schools, and are listed based on the findings per research questions:

**1.1 Integration of Digital and Interactive Technologies in Teaching:** The pandemic highlighted how digital technology has the ability to revolutionize schooling. To improve the delivery of instruction, secondary schools are advised to systematically integrate digital tools, multimedia resources, and virtual simulations. In order to manage content, track student progress, and improve teacher-student collaboration, platforms like Google Classroom, Canvas, and Microsoft Teams ought to be established as essential learning management systems. Beyond these, peer collaboration and ongoing feedback can be facilitated by the innovative use of social communication platforms like WhatsApp, Telegram, and Messenger, especially in educational institutions with restricted access to official LMS infrastructure. The use of virtual laboratory simulations, such as PhET Interactive Simulations, ought to be given top priority in the fields of science and technology. By enabling students to perform experiments in a safe virtual setting, these technologies make up for the ongoing dearth of laboratory supplies and safety issues that educators have voiced. Additionally, using multimedia resources like films from Khan Academy and TED-Ed can enhance conceptual understanding and accommodate a variety of learning styles. Engaging whiteboards and smart boards, when available, may turn classes into engaging experiences that bring abstract ideas to life. The viability and educational worth of this technology have already been proven by colleges such as Queen's College, offering a scalable model for additional establishments. In order to offer immersive field experiences, particularly in geography, history, and the sciences, augmented and virtual reality (AR/VR) systems like Google Expeditions and Oculus Rift may be progressively included into the curriculum. By relating pupils to experiential, real-world environments, these technologies can reduce the drawbacks of conventional, text-based learning approaches and promote deeper cognitive engagement.

## **1.2 Transformation from Lecture-Based to Active and Critical Learning Approaches:**

To overcome the entrenched culture of teacher-centered instruction, this study recommends the systematic adoption of active learning pedagogies that emphasize student engagement, critical thinking, and collaboration. Methods such as think-pair-share, problem-based learning, and case study analysis should replace or supplement conventional lectures. As Prince (2004) demonstrated, active learning strategies significantly enhance students' comprehension and retention compared to traditional methods. The flipped classroom model, as advanced by Bergmann & Sams (2012), should also be institutionalized, whereby pre-recorded lectures or digital readings are completed before class, allowing in-person time to focus on discussion, debate, and application. In Guyana, where many schools struggle with a lack of human resources, such as topic specialists in subjects like Caribbean history, this strategy could be especially revolutionary. Distributing recorded lessons among schools could lessen educational inequalities and democratize access to professional training. Reflective inquiry and metacognitive abilities can be further developed using the Socratic Method, which involves systematic dialogue and questioning (Paul & Elder, 2007). Finally, because learner-centered pedagogy views students as co-constructors of information rather than passive users, it is consistent with Bligh's (2000) and Bonwell & Eison's (1991) critique of lecture domination.

## **1.3 Professional Development in Digital Pedagogy and Online Teaching Competence:**

According to the research, a large number of teachers had little digital literacy when the pandemic struck, which resulted in uneven instruction during the last-minute switch to online learning. This could be addressed by making digital pedagogy continuous professional development (CPD) an official and required part of teacher preparation and assessment. Instructional design for online environments, digital assessment literacy,

and student engagement tactics unique to hybrid or virtual classrooms must all be included in training programmes that go beyond simple technical tutorials. Professional learning communities (PLCs) where educators jointly investigate new technologies, exchange best practices, and co-create online courses should be supported by educational authorities. Peer mentoring, reflective practice, and ongoing professional development are all encouraged in these kinds of groups. Additionally, it is advised that teachers participate in practical workshops that mimic actual online classroom situations. This will enable them to test out various tools, solve problems, and develop their confidence in digital delivery. As educators move toward greater technology-mediated instruction, the establishment of institutional support mechanisms, such as help desks and mentorship programmes, will guarantee that they receive both pedagogical and technical supervision. The ultimate goal is to develop a teaching workforce that is digitally proficient and able to use technology to encourage students' curiosity, creativity, and higher-order thinking skills, not just technological proficiency.

**1.4 Curriculum Reform to Embed Experiential and Project-Based Learning:** The pandemic brought to light the necessity of curriculum that go beyond memorization and test-taking strategies. Therefore, it is advised that the secondary school curriculum be updated to include project-based, interdisciplinary, and experiential learning strategies that connect academic material to real-world problems. Incorporating capstone projects, community-based assignments, and internships with nearby groups, for instance, can assist students in applying their academic knowledge in real-world settings, boosting their employability and motivation. A curriculum that is in line with industry-specific competencies such as innovation, entrepreneurship, digital literacy, and environmental stewardship would guarantee that students get skills that are applicable to a labor market that is changing quickly. Access to mentorship, internships, and chances for applied

learning can be made easier by partnerships between educational institutions and businesses. Additionally, students are encouraged to critically review their learning processes through the incorporation of reflective and collaborative evaluations, such as group research projects and digital portfolios. These techniques turn education into a comprehensive, lifelong learning process rather than just an academic activity.

**2.1 Strengthening Context-Sensitive Pedagogical Frameworks:** According to the investigation, the nature and efficacy of instruction in Guyana's secondary schools were significantly impacted by differences in geography and infrastructure. These variations were a result of structural and environmental limitations rather than instructional decisions. The Ministry of Education and associated organizations are therefore advised by this study to create context-sensitive instructional frameworks that specifically take into consideration regional realities, cultural diversity, and infrastructure accessibility. Delivering curricula in a one-size-fits-all manner has not worked, especially in areas where logistical obstacles prevent the use of contemporary techniques. These frameworks need to support schools in modifying their methods of education in light of student needs, community involvement, and available resources. For example, interior and riverine schools could incorporate community initiatives, outdoor fieldwork, and local resource-based learning, whereas urban schools might use technology-driven and inquiry-based instruction. Such contextual adaptation acknowledges that diverse practice, not methodological homogeneity, is necessary for educational justice. Localized pedagogy modules must be incorporated into pre-service and in-service training for teacher education programmes in order to incorporate these principles. Teachers should be prepared to evaluate their classrooms, spot obstacles, and adapt lesson plans in novel ways while upholding the integrity of the curriculum. Additionally, criteria that encourage creativity in contextual adaptation rather than adherence to conventional

education should be included in national performance evaluations and teacher rating systems. At the systemic level, regional education offices ought to be empowered to create micro-curricula that take into account local circumstances and learning priorities while adhering to the national framework. This structural change would guarantee that teacher proficiency and institutional adaptability, rather than just geographic location, determine the quality of education. This suggestion, which calls for a purposeful policy shift toward fairness through contextualized education, directly addresses the result that pedagogical variation was more influenced by geography than by instructional design.

## **2.2 Equitable Resource Allocation and Technological Infrastructure Development:**

Inequalities in classroom facilities, energy, and digital resource availability were closely associated with differences in teaching quality and pedagogical approach. As a result, the study suggests that legislators create a strategy for the equitable distribution of resources that is based on data-driven decision-making and sustainable technological integration. Inequalities in infrastructure across inner, rural, and urban areas should be carefully evaluated and addressed by this policy. Scalability and sustainability should be given top priority when allocating resources. Low-bandwidth digital libraries, offline educational databases, and solar-powered learning equipment can all be installed in interior classrooms so they can operate without constant internet access. By bridging the gap between technology aspirations and practical realities, these interventions would lessen reliance on conventional chalk-and-talk techniques. Partnerships with renewable energy providers could sustain electricity for educational facilities in areas with inadequate energy supplies, guaranteeing steady access to digital resources. Students and teachers from satellite schools would also be able to use shared facilities if regional digital hubs—community learning centers with dependable connectivity and resource access—were established. By serving as sites for teacher professional development,

these hubs could establish a self-reinforcing system of technology diffusion and capability. Resource deployment management and oversight ought to be transparent and centralized. The Ministry should receive regular progress reports from each regional education department, which should also keep an electronic inventory of the learning aids and monitor their use. National planning would be informed by this data, guaranteeing that upcoming interventions are fair and supported by evidence. It is clear that technology availability is a matter of educational fairness rather than just modernization when this proposal is paired with the discovery that traditional, resource-poor institutions have persisted in using antiquated teaching techniques. An equitable infrastructure plan will reduce the urban/interior divide that has remained in Guyana's educational system by fostering the pedagogical innovation that is required.

**2.3 Building Teacher Capacity for Adaptive and Reflective Practice:** The study found that teachers frequently adjusted to what was feasible in their surroundings rather than what was pedagogically ideal, making teaching diversity less deliberate and more situational. This emphasized how urgently capacity-building programmes that support reflective and flexible teaching methods in all kinds of schools are needed. Professional development has to shift from intermittent workshops to ongoing forms of professional learning that prioritize peer mentoring, reflection, and real-world application. Educators ought to receive case-based training that replicates actual classroom difficulties so they can experience making adaptive decisions in a range of scenarios involving different student backgrounds, class sizes, and resource availability. Collaborative learning might be institutionalized throughout the educational system with the creation of Regional Teacher Learning Communities (RTLCS). These communities would give educators a forum to exchange creative methods, collaborate on lesson plans, and solve problems together. Crucially, RTLCS should not be restricted to urban areas; instead, they should

follow a hub-and-spoke model in which more established institutions serve as mentors to smaller or more distant ones. Furthermore, reflective practice must be incorporated into assessment frameworks at teacher training institutes, where teachers must show how they adapt their lessons in response to student feedback and contextual limitations. A culture of continuous development and accountability can be promoted through classroom action research projects, peer observations, and reflective journals. This suggestion is directly related to research that indicates pedagogical flexibility was uneven and mostly found in urban schools, indicating that system-wide cultivation of this skill is necessary. Regardless of the resources available, educators would be better equipped to make informed decisions about their lessons if their reflective and adaptive skills were strengthened. Long-term, this change would support pedagogical resilience, guaranteeing that educators throughout Guyana can continue to deliver quality instruction even in the face of shifting or difficult conditions.

**2.4 Integrating Monitoring, Evaluation, and Research into Educational Reform:** The results showed that although reforms had been implemented, there was insufficient systematic monitoring, which resulted in inconsistent implementation and a lack of knowledge about what worked in various educational contexts. Therefore, it is advised that the Ministry of Education create an extensive Monitoring, Evaluation, and Research (MER) Framework devoted to regional innovation and quality instruction. Clear metrics for student performance, resource use, and pedagogical development that are broken down by region and school type should be part of this framework. Digital reporting platforms, instructor self-assessments, and recurring external evaluations should all be used to continuously gather data. Teachers, principals, and regional officials should be involved in the MER process as contributors rather than passive recipients of evaluations. To facilitate long-term research on instructional strategies, technology

integration, and learning outcomes, partnerships between academic institutions and local education departments ought to be established. This would produce locally pertinent research evidence to drive policy choices, substituting long-term, evidence-based reform cycles for ad hoc interventions. Additionally, yearly regional symposia and national education conferences might be held to exchange best practices, disseminate research, and guide curriculum reform. By incorporating MER into the creation of policies, interventions are guaranteed to stay flexible, quantifiable, and sensitive to changing conditions in the classroom. This suggestion is in line with the discovery that regional differences in instruction continued in part because of disjointed supervision and inadequate data feedback systems. Guyana's education sector would become data-driven, contextually aware, and constantly improving if assessment and research were integrated into the core of educational governance, changing the system from reactive reform to proactive innovation.

**3.1 Strengthening Teacher Capacity for Hybrid and Adaptive Instruction:** The results showed that whereas Charity Secondary, a rural, low-resource school, saw sharp drops in matriculation rates, schools like Queen's College and St. Roses High, which successfully implemented hybrid and online learning, maintained high matriculation rates. This study highlights post-pandemic professional development that focuses explicitly on hybrid teaching and adaptive lesson planning, building on RQ1 and RQ2 recommendations on digital pedagogy. To guarantee that learning continues even in the face of interruptions, teachers should be trained in integrating digital, in-person, and mixed approaches. Teachers' comfort in using digital tools and juggling synchronous and asynchronous learning can be increased by participating in hands-on workshops that mimic hybrid classroom circumstances. It is important to institutionalize reflective practice and scenario-based CPD because they enable teachers to adapt to changing circumstances and

student needs, especially in environments with limited resources.

**3.2 Targeted Support for Low-Performing and Resource-Poor Schools:** The findings from Charity Secondary showed that students' performance was significantly impacted by irregular instruction, a lack of access to digital resources, and a teacher's restricted competence. A tiered intervention approach that offers underperforming schools extra resources, instructional support, and mentorship is advised in order to alleviate such disparities. This can entail establishing up peer-teaching collaborations with high-achieving schools, deploying mobile digital labs, and providing teachers in low-resource environments with specialized training. Policymakers may guarantee that interventions are both successful and context-sensitive, addressing the urban-rural disparity that the findings indicate, by developing focused assistance programmes based on empirical performance data.

**3.3 Integration of Socio-Emotional Learning (SEL) and Pastoral Support:** According to the study, the pandemic caused increased stress and worry in both teachers and students, which had an impact on performance results. Thus, SEL programmes must to be incorporated into the curriculum and regular school activities. Students can manage stress, anxiety, and learning disruptions with the support of counseling services, mentorship programmes, and teacher-led well-being initiatives. In remote or under-resourced schools, where students were disproportionately impacted by disruptions in instruction, it is especially important to strengthen pastoral care. Although these metrics are specifically tailored to the post-pandemic Guyanese setting, they are consistent with international research highlighting the connection between academic success and mental health.

**3.4 Enhanced Leadership and Institutional Resilience:** The results demonstrated how proactive leadership enabled schools, like Queen's College specifically, to successfully

sustain high performance even during disruptive times. Therefore, it is advised that principals, department heads, and school administration teams participate in leadership development programmes. These programmes ought to emphasize data-driven decision-making, teacher mentoring, crisis management, and hybrid learning supervision. In order to protect students' academic results, empowered leadership will make sure that schools may use adaptive teaching techniques, track performance patterns, and react quickly to disturbances.

### **3.5 Institutionalization of Monitoring, Evaluation, and Research Focused on Hybrid**

**Learning Outcomes:** RQ3 emphasizes the necessity of ongoing, post-pandemic assessment that is especially targeted at hybrid and blended learning, whereas RQ2 suggested more comprehensive monitoring and evaluation frameworks. To assess how well educational modifications are working, schools should monitor student engagement, digital participation, and CSEC performance during exam sessions. To inform context-sensitive actions, data should be broken down by school type, geography, and resource availability. In order to address the inequities identified in the CSEC data, collaborations among educational institutions, regional offices, and policymakers can guarantee that findings inform both short-term remediation and long-term strategic planning.

### **3.6 Sustaining Digital Infrastructure and Technological Support in Schools:**

The study found that differences in digital access were a major factor in the different results between urban and rural schools. While RQ1 and RQ2 focused on general digital integration, RQ3 highlights hybrid learning environments' sustainable post-pandemic support. Schools should create internal digital resource hubs, have technical support staff, and have up-to-date learning management systems. This eliminates the performance gaps seen in the results and guarantees that teachers in both high- and low-resource situations can regularly provide high-quality education.

### **3.7 Promoting Peer Collaboration and Knowledge Sharing Among Educators:**

According to the survey, teachers at high-performing schools frequently exchanged best practices, particularly with relation to online and hybrid learning. Establishing regional teacher learning communities would allow educators to share strategies, co-create resources, and work together to solve instructional problems in order to duplicate this achievement. This programme is designed to promote post-pandemic pedagogical resilience and enhance CSEC performance across schools with different resources, and it supplements the CPD guidelines in RQ1 and RQ2.

**4.1 Strengthen Teacher Capacity for Hybrid and Adaptive Instruction:** While 84.2% of students acknowledged that teaching methodologies had changed since the pandemic, just 49% said they preferred the new approaches, according to the research. This suggests that teachers' use of digital and blended learning strategies has been uneven. Teachers should take part in practical workshops, scenario-based training, and reflective practice to close this gap and enhance their capacity to modify teachings for a variety of classroom settings. Effectively integrating digital and in-person tactics should be emphasized in training to ensure learning continuity, especially in rural or low-resource schools where technological integration has been inconsistent.

### **4.2 Provide Targeted Support for Low-Performing and Resource-Constrained Schools:**

Results showed that inconsistent digital learning implementation and restricted access to technology resources linked to lower student engagement and performance in under-resourced schools. Mobile digital laboratories, mentorship programmes from high-achieving schools, and specialized instructional support should be offered in order to lessen these discrepancies. Tiered interventions that are based on empirical performance data can guarantee that students who were disproportionately impacted by the transition to post-pandemic teaching approaches see improvements in their academic performance and

level of engagement.

**4.3 Integrate Socio-Emotional Learning (SEL) and Pastoral Support:** According to the statistics, 20% of students reported being distracted and having less interaction in digitally mediated classrooms, and stress associated to the pandemic affected both students and teachers. Students' academic attention and stress management will be enhanced by integrating SEL programmes, counseling services, teacher-led well-being initiatives, and mentorship into school routines. In remote and marginalized schools, where children experienced increased disturbance and little in-person engagement with teachers, this support is especially important.

**4.4 Enhance School Leadership and Institutional Resilience:** According to the statistics, 20% of students reported being distracted and having less interaction in digitally mediated classrooms, and stress associated to the pandemic affected both students and teachers. Students' academic attention and stress management will be enhanced by integrating SEL programmes, counseling services, teacher-led well-being initiatives, and mentorship into school routines. In remote and marginalized schools, where children experienced increased disturbance and little in-person engagement with teachers, this support is especially important.

**4.5 Institutionalize Monitoring, Evaluation, and Research (MER) for Hybrid Learning Outcomes:** The study demonstrated that disparate student experiences and outcomes were caused by the uneven application of post-pandemic teaching practices. Schools will be able to monitor student involvement, digital engagement, and academic achievement in blended learning settings by putting in place rigorous MER frameworks. In order to fill in the gaps identified in the RQ4 findings, data disaggregation by school type, geography, and resource availability will facilitate context-specific interventions and evidence-based policy decisions.

**4.6 Promote Post-Pandemic Pedagogical Collaboration Among Educators:** The results of the survey showed that whereas lower-performing schools frequently lacked access to shared knowledge on successful hybrid tactics, high-performing schools profited from collaborative practices. By creating regional teacher learning communities, educators will be able to exchange best practices, jointly develop materials, and work together to address problems in the classroom. By addressing the inequities identified in the study, this strategy will enhance student engagement and foster post-pandemic pedagogical resilience in schools with different resources.

**5.1 Institutionalize Digital Pedagogy within Professional Standards:** The recent findings indicate that a more permanent and systematized framework is required, whereas previous reforms concentrated on giving educators digital competency training. It is suggested that the Ministry of Education include hybrid teaching proficiency and digital pedagogy in the national professional requirements for educators. This would guarantee that data-informed training, flexible assessment, and technical literacy become required skills for certification and advancement. The study's conclusion that teacher readiness had a direct impact on student engagement and performance is supported by this institutionalization, which turns digital skill development from an ad hoc intervention into a long-term professional expectation.

**5.2 Develop a Sustainable National Framework for Educational Technology and Infrastructure:** According to the study, ongoing disparities in digital access, especially in rural and hinterland areas, continue to obstruct equitable learning results. A unified national framework that guarantees not just the growth of digital infrastructure but also its continuous upkeep, financing, and assessment should be put in place to solve this. To guarantee that all schools, regardless of location, can successfully support digital and blended learning, this framework should place a higher priority on long-term

sustainability, system interoperability, and routine monitoring than it does on the supply of devices or connectivity. This is consistent with research showing that uneven access to technology reduced student engagement and the quality of instruction.

**5.3 Strengthen Student Support Systems and Institutional Coordination:** The results demonstrated how pupils' emotional and academic divides widened after the pandemic. Student support services should be extended beyond particular schools to a more organized and coordinated system that includes academic mentors, guidance counselors, and digital learning consultants in order to overcome these inequities. Schools would be better prepared to offer fair help if student support were institutionalized at the regional and national levels, particularly for students in distant or economically disadvantaged areas. This suggestion builds on the study's finding that sustained student engagement in hybrid and technology-enhanced learning requires reliable and well run support systems.

**5.4 Regulate Screen Time and Promote Digital Well-being Policies:** The findings' growing worry regarding digital tiredness and students' diminished focus as a result of prolonged online learning was one of their distinctive features. Clear national rules for digital engagement, screen time balance, and cognitive health should be established by educational authorities in order to lessen this. In order to supplement technology use, policies should encourage the incorporation of offline, experiential, and community-based learning components. Schools would maintain the benefits of digital learning while safeguarding students' mental and physical health in this way, making sure that technology is used as a teaching tool rather than a stressor.

**5.5 Create a National Monitoring, Evaluation, and Research (MER) Framework for Post-Pandemic Education Reform:** The results demonstrated that evaluating the long-term impacts of hybrid and flexible learning was hampered by fragmented data systems. To gather, examine, and use data on student performance, engagement, and well-being

across digital and in-person modalities, a thorough MER framework should be created. Crucially, in order to facilitate adaptive learning policies and ongoing development, this framework should have feedback loops between educators, school officials, and legislators. By institutionalizing evidence-based decision-making, such a strategy would guarantee that post-pandemic reforms are effective, responsive, and based on actual classroom experiences.

**5.6 Promote Policy Coherence and Institutional Collaboration:** The study discovered that innovation was frequently hampered by discrepancies between national policy directions and school-level implementation. In order to standardize tactics at all governmental levels, it is advised that the Ministry of Education create a cooperative platform that includes teacher unions, regional education officials, and school administrators. The school system may make sure that welfare, pedagogical, and technology efforts work together rather than separately by enhancing policy coherence and coordination. Findings that highlighted the necessity of stakeholder alignment and communication in order to maintain long-term educational reform are directly addressed by this proposal.

In conclusion, this complete collection of suggestions provides a diversified approach to resolving the issues that Guyana's high schools confront, particularly in the aftermath of the COVID-19 pandemic. Using the proposed strategies, educators can tailor their teaching methods to the needs of diverse student populations, improve student engagement and critical thinking skills, and ensure equitable access to educational resources regardless of geographic location or economic disparities.

Overall, implementing these proposals has the potential to greatly enhance Guyana's educational quality, establishing a precedent for other Caribbean and Latin American countries experiencing comparable issues. This framework seeks to contribute to the creation of a fairer

and successful education system by encouraging innovation, inclusion, and adaptation.

### **5.2.1 Policy Implications and Strategic Actions**

For Guyana's Ministry of Education, the National Center for Educational Resource Development (NCERD), and other education stakeholders, the study has a number of policy ramifications. In addition to exposing infrastructure flaws, the pandemic highlighted the necessity of systemic change to advance resilience, fairness, and digital competency in the education sector.

1. **Putting professional training and digital literacy into practice:** The incorporation of blended learning and digital literacy into teacher education programmes was one of the main policy recommendations. The creation of required digital certification for pre-service and in-service teachers was urged by the Ministry and NCERD. Beyond technological proficiency, such training must cover instructional design, online engagement tactics, and digital ethics. Teachers may have been rewarded for learning new technologies through micro-credentialing systems, which would have encouraged ongoing professional development.
2. **Increasing fair access via infrastructure collaborations:** Targeted infrastructure investment was necessary due to persistent inequities in access to electricity and the internet, particularly in rural areas. To increase broadband coverage and provide teachers and students discounted data rates, the government might have partnered with telecom firms. For isolated villages, solar-powered learning hubs and community ICT centers provided fair substitutes. Guyana might have followed the successful examples set by nations like Barbados and Rwanda, which used private partnerships to increase national connectivity.
3. **Updating curriculum frameworks and assessments:** It was suggested that the

Ministry update its evaluation procedures to incorporate competency-based and integrated learning. During the pandemic, the system's vulnerability was brought to light by the use of conventional pen-and-paper exams. In line with CXC's modernization trajectory, policies were required to facilitate the gradual adoption of digital portfolios, e-testing, and project-based evaluations. Additionally, it was anticipated that curriculum reform would incorporate autonomous inquiry, problem-solving, and digital skills as cross-cutting competences from primary to secondary levels.

4. **Promoting the welfare of educators and students:** It was impossible to ignore the pandemic's psychological effects. Students experienced anxiety, loneliness, and burnout, while teachers expressed stress, weariness, and emotional exhaustion as a result of the quick shift to digital technology. The Ministry of Education was urged to offer access to counselors with training in digital wellbeing and to institutionalize psychosocial support services in schools. The emotional stress of hybrid teaching was lessened with time management and online pedagogy training.
5. **Bolstering data-driven monitoring and policy:** Lastly, comprehensive data collection on access, attendance, and learning outcomes across modalities was required to inform policy. Continuous monitoring and evidence-based decision-making may have been made possible by establishing a national education technology observatory within NCERD. These systems made ensuring that reforms were both long-lasting and adaptable to changing demands.

Together, these suggestions sought to build a more fair and flexible educational system that turned the pandemic's lessons into a basis for long-term resilience.

### **5.3 Recommendations for future research**

One of the industries most impacted by the COVID-19 pandemic, which has caused commercial upheavals never seen before, is education. The effects of Guyana on the educational system have been especially noticeable, underscoring both the immediate difficulties brought on by the pandemic and the possibility of longer-term adjustments to educational processes. The purpose of this study was to shed light on the magnitude of these impacts and determine whether the observed changes in teaching strategies were merely short-term solutions or a sign of more significant and long-term changes. This research provided a vital starting point for understanding the broader impacts of the pandemic on academic education in Guyana by examining the disruptions and adjustments made to the educational system during this period. The following recommendations are made in conjunction to the data acquired throughout this study:

- 1. Longitudinal Research on Hybrid Teaching Sustainability:** The study's findings showed that hybrid teaching strategies—which combine online and in-person instruction—have become increasingly popular in secondary schools in Guyana. Although these approaches were widely employed to cope with the COVID-19 pandemic's disturbances, little is known about their long-term durability, efficacy, and profitability. Therefore, longitudinal study designs that monitor changes in teaching tactics across several academic cycles should be given priority in future research. This will allow for a thorough evaluation of the continuing effects of digital tools, blended learning, and virtual assistance on student learning results. When it comes to differentiating between temporary adjustments made during emergencies and long-lasting pedagogical advancements that improve the quality of instruction, longitudinal studies are especially helpful. Researchers may, for instance, look at whether the initial gains in student involvement and engagement seen with platforms like

Microsoft Teams and Google Classroom are sustained over numerous semesters or if they decline once the acute strains of the pandemic pass. It is critical to take into account teacher attributes such as years of experience, digital literacy, previous professional development, and technological innovation adaptability, in addition to student results. Monitoring these variables over time can help identify the circumstances in which hybrid learning promotes long-term gains in student success and instructional efficacy. Additionally, longitudinal studies can shed information on how hybrid learning affects different subjects, student populations, and educational environments, pointing to possible differences in participation, understanding, and teamwork. Potential unintended implications should also be carefully considered, such as difficulties in establishing collaborative skills through online platforms, unequal student involvement, and cognitive overload for educators maintaining many platforms. This line of inquiry would be strengthened by a mixed-methods approach, which would combine qualitative information from student focus groups, teacher interviews, and classroom observations with quantitative data from academic performance, attendance rates, and engagement indicators. A more thorough knowledge of the long-term impacts of hybrid teaching on educational practices in Guyana would result from such a thorough methodology, which would provide nuanced insights into the interaction between technology, pedagogy, and student results. This research would provide school administrators and policymakers with the data they need to make well-informed decisions regarding investments in professional development programmes, teacher support initiatives, and digital infrastructure by identifying best practices, success factors, and potential pitfalls. The longevity of hybrid teaching models, as well as their potential to spur pedagogical innovation, boost teacher effectiveness, and increase student learning outcomes over time, may ultimately be revealed via a longitudinal, mixed-methods approach.

**2. Comparative Research Between Urban and Rural Schools:** Significant disparities between urban and rural schools were highlighted by this study, particularly in terms of infrastructure, resources, and access to digital learning materials. Future research should concentrate on in-depth comparative evaluations of how socioeconomic and geographic factors impact academic outcomes, student involvement, and instructional practices. Urban schools may benefit from faster internet access, more reliable device availability, and proximity to support services, whereas rural schools may face challenges such as inconsistent energy, a lack of digital resources, and fewer professional development opportunities. Research should combine quantitative and qualitative methodologies, integrating case studies, interviews, and statistical assessments of student performance to represent the varied perspectives of educators and students in a range of circumstances. By identifying these disparities, research can assist in directing efforts that aim to distribute resources equitably, offer targeted training, and use pedagogical approaches that are appropriate for a particular context. Additionally, comparative studies might look at innovative strategies employed in rural areas, such as mobile classrooms, community-based digital hubs, or offline learning modules, which could offer scalable strategies for other impoverished regions.

**3. Investigating Teacher Training and Professional Development:** Teachers' proficiency and self-assurance are essential for the effective integration of digital tools. Future research should examine the design, implementation, and outcomes of professional development initiatives such as seminars, online courses, and mentorship programmes. Apart from evaluating improvements in technical proficiency, these studies should look into how these skills may be applied to improve student learning outcomes and classroom instruction. Researchers should examine the challenges educators face, such as time limits, a lack of institutional support, or restricted access to technology, in order to ascertain how

adoption rates are impacted. Furthermore, research ought to examine how training may be tailored to suit varying skill levels and consider a variety of methods for both novice and experienced educators. Evaluating the relationship between professional development and measurable classroom outcomes, such as increased student engagement, greater critical thinking, and improved test scores, may help designers create programmes that are both beneficial and effective. Furthermore, longitudinal components might track teacher retention and confidence over time, ensuring that professional development expenditures yield long-term educational benefits.

**4. Psychological and Academic Impacts on Students:** Psychological pressures brought on by the pandemic have a direct impact on pupils' academic performance and learning. Future studies should look at the types, prevalence, and severity of mental health issues, such as stress, anxiety, and depression, as well as how these relate to academic performance. The efficacy of interventions, including peer support groups, school counseling services, and mindfulness programmes, and community-based mental health initiatives, should also be evaluated in studies. To further understand students' lived experiences, researchers may use a combination of qualitative interviews or focus groups with standardized mental health tests. Disparities in access to support services can also be seen by comparing schools in urban and rural areas, as well as across various socioeconomic classes. The research's conclusions can direct the development of comprehensive teaching methods that combine academic instruction with emotional health, promoting both immediate learning recovery and long-term student resilience.

**5. Evaluating Blended Learning Effectiveness:** In post-pandemic education, blended learning—which blends traditional in-person instruction with online resources—has emerged as a key component. Future research should look into the best combinations of in-person and virtual instruction, taking into account elements like academic performance,

retention, understanding, and student involvement. Contextual elements that affect blended learning success, such as institutional support, teacher and student digital literacy, and the accessibility of technology resources, should also be investigated in research. Pilot projects in diverse schools might be used for practical research, gathering input from educators and students to pinpoint problems and areas that could use improvement. Research may help guide best practices, encourage scalable implementation tactics, and guarantee that hybrid approaches improve educational results without escalating injustices by methodically assessing blended learning models.

**6. Policy and Institutional Response During Educational Disruptions:** The pandemic brought to light the necessity of strong, adaptable regulations to guarantee learning continuity in emergencies. Future studies should examine how national and school-level policies were developed and put into place, assessing how well they worked to reduce disruptions. Research should look at how government agencies, academic institutions, and other stakeholders coordinate, as well as how well policies can change to meet new challenges. By assessing both successes and shortcomings, research can provide practical recommendations for strengthening governance frameworks, designing crisis-responsive educational strategies, and ensuring continuity of learning under future emergencies. Comparative research with other countries could identify innovative policy solutions and inform the development of context-appropriate guidelines for Guyana.

**7. Addressing Technological Infrastructure and Digital Equity:** One of the biggest obstacles to attaining egalitarian education is still access to technology. Disparities in device availability, internet access, and technical assistance should be the focus of future research, especially in under-resourced and rural locations. Practical approaches to infrastructure improvement, such as community-based digital hubs, public-private partnerships, and economical technology implementation, should be the focus of future research. Research

should also look at how digital equality affects student involvement and learning results, finding strategies that effectively close the technological divide. The results of such studies may be used to inform policy choices, encourage fair access to online education, and guarantee that investments in technology result in significant advancements in education.

**8. Cultural and Environmental Contexts of Learning:** Cultural and environmental circumstances influence educational results in addition to pedagogy and resources. Future studies should examine the ways in which environmental influences, cultural norms, and values affect student learning and the efficacy of instruction. Comparative research in various cultural and geographical contexts might provide tools for customizing teaching approaches to meet local requirements. Localized curriculum changes, community involvement, and culturally sensitive teaching methods, for instance, may increase student engagement and retention. In order to ensure that educational innovations are inclusive and appropriate for the many circumstances in which students learn, research in this field will aid in the development of pedagogical models that are both effective and sensitive to these situations.

**9. Investigating Resource Allocation Inequities:** The study found that different schools allocated resources differently, especially when it came to time, commodities, and digital tools. Future studies should look at how these disparities impact teacher effectiveness and student outcomes. Research might use qualitative techniques to comprehend the lived experiences of teachers and students and quantitative techniques to map the allocation of resources. The results can guide targeted interventions, equitable resource allocation policies, and methods for making the most of already-existing resources, eventually advancing quality and equity for all schools.

**10. Examining Teacher Adaptation to Post-Pandemic Instruction:** Understanding how teachers react to the change in teaching strategies is essential to figuring out how long

post-pandemic education can last. Research ought to look at how teachers' decisions to stick with blended learning or go back to more conventional ways affect students' performance. In-depth information about instructional changes can be obtained through case studies, interviews, and classroom observations. Effective teaching strategies that may be standardized across schools to preserve instructional quality can be highlighted by this study, which can also help drive policy choices and professional development.

**11. Learning Loss and Academic Recovery:** There was substantial learning loss was due to the pandemic, especially for pupils getting ready for important tests like the Caribbean Secondary Education Certificate (CSEC). Future studies should use both longitudinal assessment data and results from standardized tests to methodically measure the degree of this learning loss across subjects, grade levels, and geographical areas. Comparative studies can show which student demographics were most impacted, whether it was by differences in instructional quality, socioeconomic position, or access to digital learning resources. In order to mitigate learning loss, research should also look at how well pandemic-era initiatives like peer tutoring, longer school hours, and remedial programmes worked. By identifying effective tactics, educators and policymakers may create focused programmes that enhance academic achievement and aid in rehabilitation, keeping children on pace for tests and future learning opportunities.

**12. Student and Teacher Perceptions of Post-Pandemic Education:** Developing successful post-pandemic educational practices requires an understanding of both educators' and students' viewpoints. Surveys, focus groups, and interviews should be used in future studies to gather information on these stakeholders' experiences, preferences, and perceived difficulties. Research might examine issues including blended learning satisfaction, digital platform participation, and the perceived sufficiency of institutional support. By combining these observations, scholars can find discrepancies between the goals of policies and their

actual effects, which aids in improving teaching strategies and professional development initiatives. The total efficacy and acceptability of policy initiatives are increased by this participatory research technique, which guarantees that future educational changes are sensitive to the needs and expectations of individuals who will be directly impacted.

**13. Developing Innovative Teaching Strategies:** This pandemic brought to light the need for flexible, innovative teaching methods that can react to abrupt changes in learning situations. Future studies should concentrate on developing and assessing innovative teaching strategies, such as project-based learning, individualized training, and interactive digital tools. Research might look at how well adaptive learning technologies, virtual simulations, and gamification strategies can improve learning outcomes and student engagement. The scalability of these tactics across various school kinds and resource circumstances should also be taken into account by researchers. This study may inform the creation of resilient and adaptable instructional frameworks, enabling teachers to meet future disruptions while upholding high standards of instruction by producing evidence-based insights into successful teaching innovations.

**14. Strengthening Governmental and Institutional Support Systems:** The success of institutional and governmental assistance is crucial to the continuation of education during emergencies. Future studies should look at the ways that inter-institutional cooperation, school leadership, and government measures helped to keep education going during the pandemic. Research might examine how funds are distributed, how technology is made available, and how emergency response plans are coordinated. Research should also look into how schools helped parents, teachers, and students, finding strategies that encouraged flexibility and resilience. These research insights can help build strong governance frameworks that guarantee proactive, well-coordinated support mechanisms that preserve educational quality and accessibility in the event of future crises.

**15. Future-Readiness and Skills Development:** The necessity of educating students for a world that is changing quickly has been highlighted by the pandemic. Future studies should assess how curriculum and teaching methods support the development of abilities that are relevant to the future, such as flexibility, digital literacy, problem-solving, and critical thinking. To evaluate their effects on students' readiness for postsecondary education and the workforce, researchers may contrast conventional curricula with cutting-edge strategies like competency-based education or multidisciplinary projects. Furthermore, studies might look at how well teachers are able to develop these abilities, finding practical ways to include future-focused skills into regular lessons. By aligning educational practices with the demands of a dynamic society, this research ensures that students are equipped to thrive in an increasingly complex world.

**16. International Comparative Studies:** Comparative studies with different nations can yield valuable insights into practical approaches to managing disruptions in education. Future research should look at how countries with comparable socioeconomic circumstances or geographical difficulties handled the disruptions in schooling caused by the pandemic. Scholars might investigate how teacher training programmes, digital learning platforms, and policy responses are used in various circumstances. These assessments can highlight creative solutions, disclose transferable tactics, and offer guidance on how to modify global best practices for the Guyanese setting. This study may strengthen the resilience of the national education system and help evidence-based reforms by placing local educational experiences within a larger global context.

**17. Optimizing Hybrid and Blended Learning Models:** Research should examine the best mix of in-person and online training to optimize student learning outcomes as hybrid and blended learning gain popularity. The impacts of alternative ratios of in-person and online training, diversified methods for various student groups, and the impact of instructional design on retention and engagement might all be investigated in future research. Research may also evaluate how well institutional support and teacher preparation contribute to the successful implementation of hybrid models. This study can direct the creation of adaptable, context-sensitive learning models that improve academic performance and engagement in a variety of educational contexts by identifying best practices.

**18. Promoting Inclusive Education:** The necessity of inclusive education that meets the needs of all pupils, including those who have impairments, linguistic obstacles, or other difficulties, has been highlighted by the pandemic. Future studies should look at methods for encouraging inclusiveness in curriculum development, classroom instruction, and school regulations. Research might evaluate how well-tailored support programmes, customized instruction, and assistive technology improve access and learning outcomes for underserved students. Research can help guide the creation of policies, the distribution of resources, and teacher preparation by discovering workable strategies for inclusion, guaranteeing that every student has an equal chance to achieve.

**19. Developing Continuous Evaluation and Improvement Frameworks:** Because of its intrinsic dynamic nature, education must constantly adapt to meet changing demands. Frameworks for ongoing observation, assessment, and development in educational institutions should be the subject of future studies. Research might look into how stakeholder input, performance measurements, and data collection can influence resource allocation, policy changes, and instructional techniques. Research can provide adaptive, evidence-based decision-making that improves educational quality and guarantees a response to new problems by putting in place mechanisms for continuous evaluation. By encouraging a culture of constant improvement, this strategy puts schools in a position to foresee and successfully handle future crises.

**20. Assessing Critical Skills Development in Rural Contexts:** The rapid use of digital tools in rural Guyana is a chance to assess how technology aids in the development of vital 21st-century abilities, including flexibility, problem-solving, communication, and teamwork. In order to promote skill acquisition, future studies should look at how educators combine digital platforms with conventional teaching techniques. To learn more about how digital literacy affects student learning outcomes and equality across geographically different places, studies might include observational methods, skill evaluations, and longitudinal monitoring. The research's conclusions can direct efforts aimed at resolving systemic injustices and guaranteeing that rural students acquire the abilities required for success in modern educational and occupational settings.

**21. Teacher Preparation and Digital Literacy:** In order to provide teachers with the abilities necessary for digital education, teacher preparation programmes have had to quickly change. Future studies should look at how these programmes have changed over time and assess how well they work to build the skills necessary for success in the classroom. In addition to examining difficulties in maintaining digital competency over time, studies might evaluate the curriculum material, teaching strategies, and support systems offered to pre-service and in-service teachers. The design of teacher preparation programmes that are responsive, contextually relevant, and able to support ongoing professional development can be influenced by research in this field, which will eventually improve the caliber of instruction and student results.

**22. Evaluating the Impact of Hybrid Models on Educational Equity:** If properly used, hybrid and blended learning approaches have the potential to lessen educational disparities. Future studies should look at how technology, pedagogy, and equity interact to determine if digital interventions give marginalized groups better access to high-quality education. Research might monitor participation, learning results, and student engagement among socioeconomically and geographically varied populations. Furthermore, studies might look at creative hybrid models that tackle obstacles including poor internet connectivity, a lack of resources, and situational difficulties in underserved and rural areas. Research may offer practical suggestions to guarantee that technology integration fosters inclusive and equitable learning opportunities by assessing the equity effects of hybrid education.

### **5.3.1 Future Research Directions**

This study created a number of opportunities for more research. Longitudinal and comparative studies were considered necessary to evaluate the sustainability of the noted improvements because post-pandemic schooling is dynamic and ever-evolving.

1. **Longitudinal research on hybrid learning outcomes:** Future studies should look at the long-term effects of blended learning models on teacher efficacy, academic achievement, and motivation. These studies would have offered factual information about whether the advances implemented during the pandemic resulted in long-term gains.
2. **Comparative analyses between rural and urban schools:** Future research may have examined how contextual elements, such as teacher readiness, infrastructure, and community involvement, influenced implementation success in various areas, as this study found geographic inequalities.
3. **Technological inequality and social inclusion:** Further studies may have examined the relationship between digital access and gender, socioeconomic position, and disability. This would have assisted legislators in creating more inclusive digital transformation plans.
4. **Leadership and teacher professional identity:** Researchers may have investigated how teachers' self-perception, agency, and collaborative networks changed in hybrid settings by building on the transformational leadership paradigm.
5. **Curriculum innovation and assessment reform:** Additional research might have evaluated the efficacy of novel assessment models (such as e-testing and portfolios) and their effects on equality and student learning.

In addition to advancing scholarly knowledge, these investigations would have influenced the ongoing formulation of policies in Guyana and other educational systems that had to deal with the aftermath of the pandemic.

#### **5.4 Conclusions**

The complete review of the data on long-term changes in teaching methodologies during the pandemic gives vital insights into the evolution of educational practices, notably in Guyana. The pandemic demanded a rapid transition to digital and mixed-learning approaches, emphasizing the importance of technology in modern education. This move, while difficult, highlighted the necessity of virtual assistants, which 57.4% of teachers viewed as critical in changing traditional instruction into dynamic, interactive settings. This shift is consistent with the objections of McCarthy and Anderson (2000) and Jaques (1992), who stated that traditional lecture-based techniques foster passive learning while failing to engage students actively. The classrooms of Guyana mainly utilized Google Classrooms and Zoom online supplementary sessions. Presently the Ministry is piloting TEAMS, to further enhance the students' learning experiences.

The pandemic has irreversibly changed the educational scene, bringing the internet and digital tools into regular instructional activities. Students nowadays are more digitally savvy, demanding a shift in instructional practices to match their changing expectations. As observed by Hargreaves (2003) and Selevich et al. (2015), teachers are no longer the exclusive providers of information. They must now support critical thinking, decision-making, and independent information collecting, reflecting a larger, more holistic educational function, as noted by Chodasová and Tekulová (2015).

Guyana's unique geographical and infrastructural problems have a considerable influence on education delivery. According to the research, the biggest challenges are a lack of

reliable electricity infrastructure and internet access, particularly in remote regions. Despite these limitations, the imaginative use of remote learning alternatives such as the Internet, postal services, television, and radio has established a new standard. This adaptation is consistent with worldwide trends that highlight crisis-driven innovation in the education sector (United Nations, 2020). Guyana has started the Guyana Learning Channel (GLC) which is both television and radio programmes to further enhance the student's learning experiences. This is quite targeted for those students without internet or enough devices, since these programmes, especially on the radio stations are free for the students. The television programmes is available once the students have access to cable television.

Charity Secondary School shows the inequities created by geographical and infrastructural restrictions. The school's failure to finish the CSEC syllabi as a result of these constraints stands in sharp contrast to the success of other schools that may benefit from online classes and improved resources. This difference emphasizes the crucial need for equal resource distribution and infrastructure assistance in ensuring that all students, regardless of geography, have access to a quality education. As compared to Queen's College, which has access to a plethora of resources from all of its stakeholders has allowed them to have more efficiency in not only the completion of the syllabi but also have the same level or even better work submitted to CXC. At present, Queen's College has implemented smart boards in all of its classrooms, which would not be found in any other High Schools in Guyana. So even though there is somewhat of an equal distribution, there does not exist an equitable distribution of resources.

The pandemic's effect on students' performance on the CSEC examinations offers a more nuanced perspective of the difficulties encountered. In addition to the severe interruptions brought on by the pandemic, the disparities in enrollment rates between schools are a reflection of larger, structural problems with the way education is delivered. According

to Hodges et al. (2020) and Kecojevic et al. (2020), the transition to online learning and the stress it brought about had a major impact on the wellbeing of teachers and students, possibly jeopardizing academic success. The results also show how important it is for educators to have professional training in digital literacy and online instruction. Teachers' preparedness deficiencies were exposed by the shift to online learning, highlighting the significance of continual professional development for skill enhancement. According to Davis & Yoo (2020), educators must be prepared to adjust to evolving technologies and methods. The Ministry of Education and NCERD provided training to teachers on how to use TEAMS and Google Classrooms. It has been piloted in a few schools, but not all of them have fully adopted it.

Furthermore, comparing traditional and online assessment processes demonstrates the need for flexibility and creativity in evaluating student performance. Williams & Wong (2020) argue for flexible assessment methodologies to facilitate remote learning, but Burns & Diamond (2020) emphasize the significance of strong educational institutions and legislative changes to improve teacher preparedness and digital resource availability. Despite the health hazards, Guyana's dependence on traditional paper-and-pen tests throughout the pandemic highlights the need for policy reforms that adapt assessment methodologies to the new normal. Traditional assessments are being replaced to a minute extent by schools in the City with e-testing, as they follow the pattern of CXC with their implementation of e-testing for CSEC examinations in some subjects like AutoCAD and Electronic Data Preparation and Management.

The pandemic's long-term influence on education is seen by the continued usage of blended learning models that combine conventional and digital methodologies. Dowling et al. (2003) endorse this hybrid strategy, which improves student engagement and learning results while also enabling instructional flexibility and resilience. However, the successful deployment

of blended learning necessitates addressing issues such as unequal access to devices and internet connectivity, as well as disparities in technological competency between teachers and students. These should not deter the complete implementation of these hybrid strategies as some areas can facilitate so that they can have access while the government allocates more of its monies to further enhance the other areas.

The investigation of students' viewpoints on changes in traditional teaching techniques reveals the different requirements and preferences of the students. The emphasis on blended learning, student assistance, clear communication, and interactive learning reflects students' shifting expectations in a post-pandemic environment. This feedback emphasizes the value of hands-on activities, smartboards, and a student-centered approach to teaching. Student input may help educators create more inclusive and successful learning environments.

Educator feedback emphasizes the importance of continual professional growth, adaptive assessment methodologies, and friendly online settings. Teachers stress the value of tools for navigating hybrid teaching styles and applying curricular information in real-world settings. These findings underline the crucial role that educators play in developing critical thinking and problem-solving abilities, as noted by Pellegrino and Hilton (2012).

The findings of this study can help shape policy changes and the creation of more inclusive and adaptable educational techniques, resulting in a more robust and successful education system in the post-pandemic age. There should be policies that foster the reformation of the curriculum to suit the changes of the pandemic. Additionally, the way that the curriculum is implemented so that teachers have more leverage in effectively matching the needs of this new era.

Although the study's conclusions were grounded in Guyana's domestic setting, they reflected worldwide patterns seen throughout underdeveloped countries during the COVID-19 pandemic. Inadequate technology or connectivity prevented nearly 463 million children

globally from accessing remote learning during school closures, according to UNESCO (2021). According to the World Bank (2022), years of gains toward universal education have been reversed as learning poverty has significantly increased in low- and middle-income nations. Guyana's history served as an example of these global inequalities, where educational discrepancies were exacerbated by infrastructure deficiencies and physical remoteness.

However, Guyana also showed resilience and inventiveness that matched more general world reactions. The Guyana Learning Channel, which broadcasts classes via radio and television to reach children in remote places, became a national lifeline, much like programmes in Jamaica and Trinidad and Tobago. These strategies were similar to those used in nations like Kenya and India, where curriculum content was delivered through public radio. These tactics highlighted how low-tech solutions can guarantee inclusivity in situations when access to high-tech resources is unequal.

From a policy perspective, Guyana joined other small developing nations that experimented with scalable digital platforms by piloting Microsoft TEAMS integration after the pandemic. Curriculum alignment and continuous teacher training were critical to the relative performance of these systems. The Organization for Economic Co-operation and Development (OECD, 2022) emphasized that even in times of crisis, blended learning would continue to be an essential component of educational institutions. In this sense, Guyana's developing blended approach placed it in the context of a rising worldwide movement toward flexible, learner-centered education.

However, the worldwide comparison also identified areas that still needed work. Guyana's decentralized educational system suffered from uneven execution, whereas nations like Singapore and Estonia used centralized digital infrastructure to provide consistent quality. The main conclusion from this comparison was that institutional capacity, policy

coherence, and cross-sector cooperation were just as important to resilience in education as technological availability. Guyana was able to create a sustainable framework for inclusive digital transformation by combining lessons learned from around the world with local circumstances.

In conclusion, the outcomes of this study highlight the pandemic's revolutionary influence on educational methods. The integration of technology, the use of blended learning methodologies, and the emphasis on teacher professional development are all crucial for improving educational resilience and effectiveness. Addressing Guyana's physical and infrastructural limitations is critical to ensuring fair access to quality education for all children.

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## APPENDICES

## Appendix A : REAF DS



REAF\_DS - Version 3.3



|  |   |
|--|---|
| <b>UNICAF UNIVERSITY</b><br><b>RESEARCH ETHICS APPLICATION FORM</b><br><b>DOCTORAL STUDIES</b> | UREC USE ONLY:<br>Application No:<br>Date Received: |
|--|---|

**Student's Name:** Riaz Zakeer Rupnarain

**Student's E-mail Address:** riazrupnarain1@gmail.com

**Student's ID #:** R2103D12034670

**Supervisor's Name:** Dr. Isaak Papadopoulos

**University Campus/Program:** Unicaf University Zambia: EdD Doctorate of Education



**Research Project Title:** THE CHANGING ROLE OF TEACHERS AND TEACHING STYLES IN THE CLASSROOM OF HIGH SCHOOLS IN GUYANA AMIDST THE PANDEMIC

**1. Please state the timelines involved in the proposed research project:**

Estimated Start Date: 01-Jan-2024

Estimated End Date: 28-Feb-2024

**2. External Research Funding (if applicable):**

**2.a. Do you have any external funding for your research?**

YES  NO

If YES, please answer questions **2b** and **2c**.

**2.b.** List any external (third party) sources of funding you plan to utilise for your project. You need to include full details on the source of funds (e.g. state, private or individual sponsor), any prior / existing or future relationships between the funding body / sponsor and any of the principal investigator(s) or co-investigator(s) or student researcher(s), status and timeline of the application and any conditions attached.

**2.c.** If there are any perceived ethical issues or potential conflicts of interest arising from applying for and/or receiving external funding for the proposed research then these need to be fully disclosed below and also further elaborated on, in the relevant sections on ethical considerations later on in this form.

### 3. The research project

#### 3.a. Project Summary:

In this section fully describe the purpose and underlying rationale for the proposed research project. Ensure that you pose the research questions to be examined, state the hypotheses, and discuss the expected results of your research and their potential.

It is important in your description to use plain language so it can be understood by all members of the UREC, especially those who are not necessarily experts in the particular discipline. To that effect ensure that you fully explain/define any technical terms or discipline-specific terminology (use the space provided in the box).

This study will demonstrate how the outbreak has impacted Guyana's educational system and provide insight into whether these modifications are short-term and will restart "business as usual" once classes resume in a traditional classroom setting. The researcher will have a better understanding of how the pandemic affects academic education through this article. Because the pandemic has shown that the educational process is always changing, the Ministry of Education may also use the data to grasp the impacts of learning loss and to design programs that will better prepare and actively engage students in the classroom.

The purpose of this study is to determine how the pandemic has impacted the educational methods of teachers. The pedagogical adjustments have mostly shown to be crucial since face-to-face training from before the outbreak cannot be translated into an online learning environment. The teachers have continued to use the traditional speak-and-chalk classroom setup for far too long.

The researcher through this study will understand the permanent changes that teachers would have made to achieve a more effective lesson and to see if the majority have kept the blended approach or have returned completely to traditional direct instructional methods. The researcher will dissect how teaching styles differ for teachers across the geographical, and economic contrast of Guyanese schools since most time resources are better allocated to the Urban schools as compared to far-flung areas in Guyana' s forested Highland Regions. Additionally, these changing teaching styles of teachers will be examined to see the impact they have created on the performance of the students at the Regional Examinations, more specifically the CSEC examinations written by Grade 11 students in the Caribbean.

### 3.b. Significance of the Proposed Research Study and Potential Benefits:

Outline the potential significance and/or benefits of the research (use the space provided in the box)

This study will demonstrate to what extent Guyana's educational system has changed to accommodate the pandemic's effects and will help determine whether these changes are only transitory or if they will revert to "business as usual" since classes have resumed in its original physical classroom environment. This paper will allow the researcher to understand how the pandemic affected the learning process in the schools. The problem statement looks to see how the pandemic has affected the teaching styles of teachers that were brought about by the pandemic. This study will be able to be used by the researcher, local school administration, and more so the Regional Examination body.

The researcher will have a better understanding of how the pandemic changed the way students learn and how a different pedagogy has to be developed to keep up with the world. Since the pandemic has affected the way Universities are now delivering the programmes, the students must be prepared for such changes as well. The Ministry of Education can use the findings to develop Curriculum modifications for the effective delivery of the syllabi to the students not only for the CSEC Examinations but generally for their future endeavours. Additionally, the information can be used by the Ministry of Education to understand the impact of learning loss and how to prepare programmes that will better equip and actively engage students in the classroom. Since the education process is always changing as the pandemic has shown. The

### 4. Project execution:

#### 4.a. The following study is an:

- experimental study (primary research)
- desktop study (secondary research)
- desktop study using existing databases involving information of human/animal subjects
- Other

If you have chosen 'Other' please Explain:

**4.b. Methods. The following study will involve:**

- a Quantitative methodology  
 a Qualitative methodology  
 a mixed methods approach

If you have chosen mixed methods please state below whether you are going to proceed with triangulation or not.

- YES       NO

**4.c. Please state below which tools you are going to use:**

| A<br>Select the tools to be used in your study       | B<br>Select how the tools selected in column A will be administered (select one or more)   | C<br>Select what types of questions will be included in the tools previously selected in column A (select one or more)  |
|--|--|---|
| Interviews<br><input checked="" type="checkbox"/>    | <input checked="" type="checkbox"/> Face-to-face<br><input checked="" type="checkbox"/> Online with camera (synchronous live discussion with camera)<br><input checked="" type="checkbox"/> Audio only (synchronous live discussion without camera, i.e., via phone)   | <input checked="" type="checkbox"/> Open-ended questions<br><input checked="" type="checkbox"/> Close-ended questions<br><input checked="" type="checkbox"/> Includes section related to demographics |
| Focus Groups<br><input type="checkbox"/>             | <input type="checkbox"/> Face-to-face<br><input type="checkbox"/> Online with camera (synchronous live discussion with camera)<br><input type="checkbox"/> Audio only (synchronous live discussion without camera, i.e., via phone)  | <input type="checkbox"/> Open-ended questions<br><input type="checkbox"/> Close-ended questions<br><input type="checkbox"/> Includes section related to demographics                                  |
| Questionnaire<br><input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Face-to-face self – administered questionnaire<br><input checked="" type="checkbox"/> Online, i.e., via phone or any other platform. The researcher reads the questions to the participants<br><input checked="" type="checkbox"/> Online asynchronous self-administered questionnaire (i.e., via email) | <input checked="" type="checkbox"/> Open-ended questions<br><input checked="" type="checkbox"/> Close-ended questions<br><input checked="" type="checkbox"/> Includes section related to demographics |

| A   | B  | C  |
|---|--|--|
| Select the tools to be used in your study | Select how the tools selected in column A will be administered (select one or more)  | Select what types of questions will be included in the tools previously selected in column A (select one or more)  |
| Experiments<br><input type="checkbox"/>   | <input type="checkbox"/> Face-to-face<br><input type="checkbox"/> Online with camera (synchronous live discussion with camera)<br><input type="checkbox"/> Audio only (synchronous live discussion without camera, i.e., via phone)<br><input type="checkbox"/> Asynchronously via any online platform | <input type="checkbox"/> Open-ended questions<br><input type="checkbox"/> Close-ended questions<br><input type="checkbox"/> Includes section related to demographics |
| Tests<br><input type="checkbox"/>         | <input type="checkbox"/> Face-to-face<br><input type="checkbox"/> Online with camera (synchronous live discussion with camera)<br><input type="checkbox"/> Audio only (synchronous live discussion without camera, i.e., via phone)<br><input type="checkbox"/> Asynchronously via any online platform | Provide a brief description of the test in the box 'Other' below.  |
| Other                                     |  |  |

### 5. Participants:

5 a. Does the Project involve the recruitment and participation of additional persons other than the researcher(s) themselves?

YES If YES, please complete all following sections.

NO If NO, please directly proceed to Question [7](#).

### 5 b. Relevant Details of the Participants of the Proposed Research

State the number of participants you plan to recruit, and explain in the box below how the total number was calculated.

Number of participants

100 students from each High School = 300  
 20 teachers from Queen's College = 20  
 15 teachers from the other two High Schools = 30

Describe important characteristics such as: demographics (e.g. age, gender, location, affiliation, level of fitness, intellectual ability etc). It is also important that you specify any inclusion and exclusion criteria that will be applied (e.g. eligibility criteria for participants).

Age range From  To

Gender  Female  
 Male

Eligibility Criteria:

- Inclusion criteria
- Exclusion criteria

Disabilities/Disorders: You should only include the participants who can provide informed consent for themselves. Individuals who have a mental disability and are not in a position to provide their own consent should not participate in the study. Please provide information for any other disabilities/disorders the participants may have:

Persons with physical and mental disabilities will not be included in the study since they are a vulnerable group.

Other relevant information (use the space provided in the box):

### 5 c. Participation & Research setting:

Clearly describe which group of participants (described in 5b) is completing/participating in the material(s)/tool(s) described in 4c above (use the space provided in the box)

All participants will be participate in the questionnaires, special questionnaires will be designed for both teachers and students, whereas interviews will be only done with the teachers.

### 5 d. Recruitment Process for Human Research Participants:

Clearly describe how the potential participants will be identified, approached and recruited (use the space provided in the box).

1. The researcher seek permission and the letter of introduction from UNICAF.
2. The letter seeking permission from the CEO at the Ministry of Education will be acquired as the gatekeeper.
3. The researcher will then introduce himself to the staff of each school and seek their permission to do the study, where a breakdown of the study will be given to them.
4. Once permission is given, stratified sampling will be used for both students and teachers since specific criteria will be given, this will be mentioned to staff and Principapl to expedite the process.
5. Consent for all participants will be sought for each participant to ensure participation.

### 5 e. Research Participants Informed Consent.

Select below which categories of participants will participate in the study. Complete the relevant Informed Consent form and submit it along with the REAF form.

| Yes                                 | No                       | Categories of participants                                  | Form to be completed           |
|-------------------------------------|--------------------------|---|--------------------------------|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Typically Developing population(s) above the maturity age * | Informed Consent Form          |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Typically Developing population(s) under the maturity age * | Guardian Informed Consent Form |

**5 f. Relationship between the principal investigator and participants.**

Is there any relationship between the principal investigator (student), co-investigators(s), (supervisor) and participant(s)? For example, if you are conducting research in a school environment on students in your classroom (e.g. instructor-student).

YES  NO

If YES, specify (use the space provided in the box).

**6. Potential Risks of the Proposed Research Study.**

**6 a. i. Are there any potential risks, psychological harm and/or ethical issues associated with the proposed research study, other than risks pertaining to everyday life events?**

YES  NO

If YES, specify below and answer the question 6 a.ii.

Travelling to Charity Secondary School is a very lengthy journey that requires several modes of transportation.

**6 a.ii Provide information on what measures will be taken in order to exclude or minimise risks described in 6.a.i.**

To visit the school for lengthy period, so this will mitigate constant travelling back and forth to the school. Additionally, the use of online questionnaires and in some cases telephone interviews will be done, this will mitigate the expenses as well.

## 6 b. Choose the appropriate option

|       |   | Yes                                 | No                       |
|-------|---|-------------------------------------|--------------------------|
| i.    | Will you obtain a written informed consent form from all participants?  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| ii.   | Does the research involve, as participants, people whose ability to give free and informed consent is in question?  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| iii.  | Does this research involve participants who are children under maturity age?<br><b>If you answered YES to question iii, complete all following questions.<br/>If you answered NO to question iii, do not answer Questions iv, v, vi and proceed to Questions vii, viii, ix and x.</b>               | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| iv.   | Will the research tools be implemented in a professional educational setting in the presence of other adults (i.e. classroom in the presence of a teacher)?   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| v.    | Will informed consent be obtained from the legal guardians (i.e. parents) of children?  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| vi.   | Will verbal assent be obtained from children?   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| vii.  | Will all data be treated as confidential?<br>If NO, explain why confidentiality of the collected data is not appropriate for this proposed research project, providing details of how all participants will be informed of the fact that any data which they will provide will not be confidential. | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| viii. | Will all participants/data collected be anonymous?<br>If NO, explain why and describe the procedures to be used to ensure the anonymity of participants and/or confidentiality of the collected data both during the conduct of the research and in the subsequent release of its findings.         | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

|  | Yes                                 | No                                  |
|--|-------------------------------------|-------------------------------------|
| ix. Have you ensured that personal data and research data collected from participants will be securely stored for five years?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| x. Does this research involve the deception of participants?<br>If YES, describe the nature and extent of the deception involved. Explain how and when the deception will be revealed, and who will administer this debrief to the participants: | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

**6 c. i. Are there any other ethical issues associated with the proposed research study that are not already adequately covered in the preceding sections?**

Yes  No

If YES, specify (maximum 150 words).

**6.c.ii Provide information on what measures will be taken in order to exclude or minimise ethical issues described in 6.c.i.**

**6 d. Indicate the Risk Rating.**

High  Low

### 7. Further Approvals

All researchers are advised to check the regulations pertaining to research and General Data Protection Regulation (GDPR) of the country in which the research will take place as each country may have different restrictions on conducting research. **Are there any other approvals required (i.e., from a ministry or public agency in the country, in addition to ethics clearance from UREC) in order to carry out the proposed research study?**

YES  NO If YES, specify.

The Chief Education Officer at the Ministry of Education.

### 8. Application Checklist

Mark ✓ if the study involves any of the following:

- Children and young people under 18 years of age, vulnerable populations such as children with special educational needs (SEN), racial or ethnic minorities, socioeconomically disadvantaged persons, pregnant women, elderly, malnourished people, and ill people.
- Research that foresees risks and disadvantages that would affect any participant of the study such as anxiety, stress, pain or physical discomfort, harm risk (which is more than is expected from everyday life) or any other act that participants might believe is detrimental to their wellbeing and/or has the potential to / will infringe on their human rights / fundamental rights.
- Risk to the well-being and personal safety of the researcher.
- Administration of any substance (food / drink / chemicals / pharmaceuticals / supplements / chemical agent or vaccines or other substances (including vitamins or food substances) to human participants.
- Results that may have an adverse impact on the natural or built environment.

### 9. Further documents

Check that the following documents are attached to your application:

|   |   | ATTACHED                            | NOT APPLICABLE                      |
|---|---|-------------------------------------|-------------------------------------|
| 1 | Recruitment advertisement (if any)  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 2 | Informed Consent Form / Guardian Informed Consent Form  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 3 | Research Tool(s)  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 4 | Gatekeeper Letter   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 5 | Any other approvals required in order to carry out the proposed research study, e.g., institutional permission (e.g. school principal or company director) or approval from a | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |

**10. Final Declaration by Applicants:**

- (a) I declare that this application is submitted on the basis that the information it contains is confidential and will only be used by Unicaf University for the explicit purpose of ethical review and monitoring of the conduct of the research proposed project as described in the preceding pages.
- (b) I understand that this information will not be used for any other purpose without my prior consent, excluding use intended to satisfy reporting requirements to relevant regulatory bodies.
- (c) The information in this form, together with any accompanying information, is complete and correct to the best of my knowledge and belief and I take full responsibility for it.
- (d) I undertake to abide by the highest possible international ethical standards governing the Code of Practice for Research Involving Human Participants, as published by the UN WHO Research Ethics Review Committee (ERC) on <http://www.who.int/ethics/research/en/> and to which Unicaf University aspires to adhere.
- (e) In addition to respect any and all relevant professional bodies' codes of conduct and/or ethical guidelines, where applicable, while in pursuit of this research project.

**I agree with all points listed under Question 10**

Student's Name: Riaz Zakeer Rupnarain

Supervisor's Name: Dr. Isaak Papadopoulos

Date of Application: 20-Mar-2011

**Important Note:**

Save your completed form (we suggest you also print a copy for your records) and then submit it to your UU Dissertation/project supervisor (tutor). **In the case of student projects, the responsibility lies with the Faculty Dissertation/Project Supervisor.** If this is a student application, then it should be submitted via the relevant link in the VLE. Please submit only electronically filled in copies; **do not** hand fill and submit scanned paper copies of this application.

## Appendix B: Gatekeeper Letter



### MINISTRY OF EDUCATION (GUYANA)

#### Office of the Chief Education Officer

26 Brickdam Stabroek Georgetown Guyana

Tel: (592)-225-6329 or (592)-226-3117

Email: ceooffice@moe.gov.gy

17<sup>th</sup> December 2023

**Mr. Riaz Zakeer Rupnarain**  
**Doctoral Student**  
**UNICAF University (Zambia Campus)**  
**GOAL SCHOLAR**

Dear Mr. Rupnarain,

**Re: Permission to conduct Research**


With reference to the above subject, please be informed that permission **has been granted** for you to conduct your research entitled ***“THE CHANGING ROLE OF TEACHERS AND TEACHING STYLES IN THE CLASSROOM OF HIGH SCHOOLS IN GUYANA AMIDST THE PANDEMIC”*** at the schools listed below:

1. **Queen's College**
2. **St. Roses High School**
3. **Charity Secondary School**

Prior to the commencement of this research, you are required to contact the relevant head teachers at these schools to schedule the visits. A copy of this letter has been sent to the Regional Education Officers/Principal Education Officer.

Upon completion, we would be grateful if a copy of this research can be submitted to the library of the National Centre for Educational Research Development (NCERD).

Yours respectfully,

  
**Saddam Hussain**  
**Chief Education Officer**

**CHIEF EDUCATION OFFICER**  
**Ministry of Education (Guyana)**

**For information:**

1. Ms. Shannielle Hoosein-Outar, Permanent Secretary, Ministry of Education

**CC:**

1. Deputy Chief Education Officer – Administration
2. Director – National Centre for Educational Research
3. Assistant Chief Education Officer- Secondary
4. Regional Education Officer/Principal Education Officer – Region 2 and Georgetown
5. Head teachers of the selected schools



## Gatekeeper letter

**Institution / Organization :** Ministry of Education

**Address:** 21 Brickdam, Georgetown

**Date:** 2nd January, 2024

**Subject:** Permission to carry out Doctoral Research

Dear Mr. Hussain,

I am a doctoral student at Unicaf University (Zambia Campus). As part of my degree I am carrying out a study on THE CHANGING ROLE OF TEACHERS AND TEACHING STYLES IN THE CLASSROOM OF HIGH SCHOOLS IN GUYANA AMIDST THE PANDEMIC.

I am writing to seek permission to use the students and teachers of Queen's College, St. Roses High School in Georgetown and Charity Secondary School in Region 2.

This permission is needed to acquire primary data necessary for the successful completion of the research. Questionnaires will be given to both students and teachers to be completed on the impact of the pandemic on learning. Interviews will be done with teachers of these schools to identify the changing roles of teachers and teaching styles. Permission is also needed to observe teachers and students relationship in classroom setting, looking at the use of varying teaching styles post pandemic.

Subject to approval by Unicaf Research Ethics Committee (UREC) this study will be using questionnaires, interviews and observation. It must be noted, that the participants are not mandated to take part and consent will be sought from parents of the children.

The research is to identify how the roles of teachers have changed amidst in the pandemic as facilitators of education in Secondary Schools in Guyana. The research intends to look at how the teaching styles of teachers evolved and its impact on the performance of students at CSEC.

Thank you in advance for your time and for your consideration of this project. Please let me know if you require any further information or need any further clarifications.

Yours Sincerely,

R.Rupnarain

**Student's Name:** Riaz Zakeer Rupnarain

**Student's E-mail:** riazrupnarain1@gmail.com

**Student's Address and Telephone:** 908 South West Cummingslodge, Greater Georgetown. 5926464788

**Supervisor's Title and Name:** Dr. Isaak Papadopoulos

**Supervisor's Position:** Head of Department of Education, School of Doctoral Studies

**Supervisor's E-mail:** i.papadopoulos@unicaf.org

## Appendix C: Template of Informed Consent Form



UU\_IC - Version 2.1



### Informed Consent Form

#### Part 1: Debriefing of Participants

**Student's Name:** Riaz Zakeer Rupnarain

**Student's E-mail Address:** riazrupnarain1@gmail.com

**Student ID #:** R2103D12034670

**Supervisor's Name:** Dr. Isaak Papadapoulos

**University Campus:** Unicaf University Zambia (UUZ)

**Program of Study:**

**Research Project Title:** THE CHANGING ROLE OF TEACHERS AND TEACHING STYLES IN THE CLASSROOM OF HIGH SCHOOLS IN GUYANA AMIDST THE PANDEMIC

**Date:** 02-Jan-2024

**Provide a short description (purpose, aim and significance) of the research project, and explain why and how you have chosen this person to participate in this research (maximum 150 words).**

This study will demonstrate how the outbreak has impacted Guyana's educational system and provide insight into whether these modifications are short-term and will restart "business as usual" once classes resume in a traditional classroom setting. The researcher would have identified you as a participant as you would have experienced the classroom setting in pre pandemic, during the pandemic and now post. More so you would have experienced all these changes at the same school with the same pedadogues. So your response will allow the researcher to garner clarity into the impact of the pandemic on teaching roels and styles in High schools of Guyana. You are required to answer the questions posited in the questionnaire with your honest feedback since your identity remains anonymous.

The above named student is committed to ensuring participant's voluntarily participation in the research project and guaranteeing there are no potential risks and/or harms to the participants.

Participants have the right to withdraw at any stage (prior or post the completion) of the research without any consequences and without providing any explanation. In these cases, data collected will be deleted.

All data and information collected will be coded and will not be accessible to anyone outside this research. Data described and included in dissemination activities will only refer to coded information ensuring beyond the bounds of possibility participant identification.

I, , ensure that all information stated above is true and that all conditions have been met.

**Student's Signature:** \_\_\_\_\_

## Informed Consent Form

### Part 2: Certificate of Consent

**This section is mandatory and should to be signed by the participant(s)**

**Student's Name:** Riaz Zakeer Rupnarain

**Student's E-mail Address:** riazrupnarain1@gmail.com

**Student ID #:** R2103D12034670

**Supervisor's Name:** Dr. Isaak Papadopoulos

**University Campus:** Unicaf University Zambia (UUZ)

**Program of Study:**

**Research Project Title:** THE CHANGING ROLE OF TEACHERS AND TEACHING STYLES IN THE CLASSROOM OF HIGH SCHOOLS IN GUYANA AMIDST THE PANDEMIC

I have read the foregoing information about this study, or it has been read to me. I have had the opportunity to ask questions and discuss about it. I have received satisfactory answers to all my questions and I have received enough information about this study. I understand that I am free to withdraw from this study at any time without giving a reason for withdrawing and without negative consequences. I consent to the use of multimedia (e.g. audio recordings, video recordings) for the purposes of my participation in this study. I understand that my data will remain anonymous and confidential, unless stated otherwise. I consent voluntarily to be a participant in this study.

Participant's Print name:

Participant's Signature: \_\_\_\_\_

Date:

**If the Participant is illiterate:**

I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had an opportunity to ask questions. I confirm that the aforementioned individual has given consent freely.

Witness's Print name:

Witness's Signature: \_\_\_\_\_

Date:

## Appendix D: Template of Guardian Informed Consent Form



UU\_GIC - Version 2.1



### Guardian Informed Consent Form

#### Part 1: Debriefing of Participants

**Student's Name:** Riaz Zakeer Rupnarain

**Student's E-mail Address:** riazrupnarain1@gmail.com

**Student ID #:** R2103D12034670

**Supervisor's Name:** Dr. Isaak Papadopoulos

**University Campus:** Choose from the list

**Program of Study:** UUZ: EdD Doctorate of Education

**Research Project Title:** THE CHANGING ROLE OF TEACHERS AND TEACHING STYLES IN THE CLASSROOM OF HIGH SCHOOLS IN GUYANA AMIDST THE PANDEMIC

**Date:** 02-Jan-2024

**Provide a short description (purpose, aim and significance) of the research project, and explain why and how you have chosen this person to participate in this research (maximum 150 words).**

This study will demonstrate how the outbreak has impacted Guyana's educational system and provide insight into whether these modifications are short-term and will restart "business as usual" once classes resume in a traditional classroom setting. The researcher will have a better understanding of how the pandemic affects academic education through this article. Because the pandemic has shown that the educational process is always changing, the Ministry of Education may also use the data to grasp the impacts of learning loss and to design programs that will better prepare and actively engage students in the classroom.

The above named Student is committed to ensuring participant's voluntarily participation in the research project and guaranteeing there are no potential risks and/or harms to the participants.

Participants have the right to withdraw at any stage (prior or post the completion) of the research without any consequences and without providing any explanation. In these cases, data collected will be deleted.

All data and information collected will be coded and will not be accessible to anyone outside this research. Data described and included in dissemination activities will only refer to coded information ensuring beyond the bounds of possibility participant identification.

I, , ensure that all information stated above is true and that all conditions have been met.

**Student's Signature:**

## Guardian Informed Consent Form

### Part 2: Certificate of Consent

**This section is mandatory and should to be signed by the participant's legal guardian**

**Student's Name:** Riaz Zakeer Rupnarain

**Student's E-mail Address:** riazrupnarain1@gmail.com

**Student ID #:** R2103D12034670

**Supervisor's Name:** Dr. Isaak Papadopoulos

**University Campus:** Choose from the list

**Program of Study:** UUZ: EdD Doctorate of Education

**Research Project Title:** THE CHANGING ROLE OF TEACHERS AND TEACHING STYLES IN THE CLASSROOM OF HIGH SCHOOLS IN GUYANA AMIDST THE PANDEMIC

I have read the foregoing information about this study, or it has been read to me. I have had the opportunity to ask questions and discuss about it. I have received satisfactory answers to all my questions and I have received enough information about this study. I understand that the participant is free to withdraw from this study at any time without giving a reason for withdrawing and without negative consequences. I consent to the use of multimedia (e.g. audio recordings, video recordings) for the purposes of the participation to this study. I understand that all data will remain anonymous and confidential, unless stated otherwise.

I, , the legal guardian  
of  allow and provide consent  
that  can willingly participate in the study.

I, , the legal guardian  
of  have been ensured that verbal consent  
given by  will also be taken before the study.

Date:

## Appendix E: Research Tools

### *QUESTIONNAIRE FOR TEACHERS*

Dear teachers,

My name is Riaz Rupnarain, a doctoral student at UNICAF University. As part of my degree, I am conducting research into 'The Changing Role of Teachers and Teaching Styles in the Classroom of High Schools in Guyana amidst the Pandemic.'

This information gathered is completely confidential and since you have to make no mention of your name or personal information, you remain anonymous. For the questions, please place a tick  in the box of your choice, and where necessary write the option in the space provided.

This study will demonstrate how the outbreak has impacted Guyana's educational system and provide insight into whether these modifications are short-term and will restart "business as usual" once classes resume in a traditional classroom setting. The researcher will have a better understanding of how the pandemic affects academic education through this article. Because the pandemic has shown that the educational process is always changing, the Ministry of Education may also use the data to grasp the impacts of learning loss and to design programmes that will better prepare and actively engage students in the classroom.

I have read the foregoing information about this study, or it has been read to me. I have had the opportunity to ask questions and discuss about it. I have received satisfactory answers to all my questions and I have received enough information about this study. I understand that I am free to withdraw from this study at any time without giving a reason for withdrawing and without negative consequences. I consent to the use of multimedia (e.g. audio recordings, video recordings) for the purposes of my participation in this study. I understand that my data will remain anonymous and confidential, unless stated otherwise.

I consent voluntarily to be a participant in this study.

With kind regard,  
Riaz Rupnarain  
Doctoral Student

1. Age

\_\_\_\_\_ (please specify)

2. What grades do you teach? Select all

Grade 10

Grade 11

Grade 12

Grade 13

3. What subjects do you teach at CSEC level?

\_\_\_\_\_ (please specify)

4. What is your primary mode of teaching at your school?

Physical

Online

Hybrid

5. During the pandemic how many hours a day did you spend on teaching formal classes?

1-2 hours

3-4 hours

5-6 hours

7-8 hours

6. How many hours a day do you spend teaching formal classes now?

1-2 hours

3-4 hours

5-6 hours

7-8 hours

7. Which classroom setting did you prefer mainly?

Online

Physical

8. How would you describe your workspace during the pandemic?

Home Office

Classroom at school

Both

9. Are there any of your classes that have remained completely virtual, although school has returned to a physical setting?

\_\_\_\_\_ (please specify)

10. During the pandemic, what was the greatest challenge you faced with classes?

Lack of device

Internet services

Power/ Electricity

Poor teaching styles

Other \_\_\_\_\_ (please specify)

11. What was your average performance in the school's examinations during the pandemic?

Poor

Fair

Good

Excellent

12. Were you able to interact more with your students during the pandemic as compared to pre-Covid?

Yes

No

13. What changes have you adapted to your teaching methods during the pandemic?

\_\_\_\_\_

14. Have you incorporated technology in your class after the pandemic?

Yes

No

15. If yes, to what extent

Daily

Thrice per week   
 Twice per week   
 Once per week

16. What were the most significant challenges you faced as a teacher returning to school after the pandemic?

Re-conditioning to the physical setting   
 Changing methodologies   
 Gaining the attention of students   
 Keeping the students meaningfully occupied with activities

Other \_\_\_\_\_  
 \_\_\_\_\_ (please specify)

17. Did you receive any training or professional development to adapt to the new teaching environment during the pandemic?

Yes   
 No

18. What changes or improvements do you think would help enhance teaching in the post-pandemic era, considering the lessons learned during the pandemic?

Provision of reliable internet to all schools   
 Frequent Professional Development Sessions for teachers in the effective use of technology in the classroom.   
 Provision of resources to facilitate a more blended classroom.   
 Other \_\_\_\_\_ (please specify)

19. What major resource or support would be helpful to improve your teaching presently?

\_\_\_\_\_

20. What recommendation would you suggest for the Ministry of Education to implement so as to foster more learning in the classroom post Covid?

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

THANK YOU!

### ***QUESTIONNAIRE FOR STUDENTS***

Dear students,

My name is Riaz Rupnarain, a doctoral student at UNICAF University. As part of my degree, I am conducting research into 'The Changing Role of Teachers and Teaching Styles in the Classroom of High Schools in Guyana amidst the Pandemic.'

This study will demonstrate how the outbreak has impacted Guyana's educational system and provide insight into whether these modifications are short-term and will restart "business as usual" once classes resume in a traditional classroom setting. The researcher will have a better understanding of how the pandemic affects academic education through this article. Because the pandemic has shown that the educational process is always changing, the Ministry of Education may also use the data to grasp the impacts of learning loss and to design programmes that will better prepare and actively engage students in the classroom.

This information gathered is completely confidential and since you have to make no mention of your name or personal information, you remain anonymous. For the questions, please place a tick  in the box of your choice, and where necessary write the option in the space provided.

Much appreciate your succour and candour in completing this questionnaire.

With kind regard,

Riaz Rupnarain

Doctoral Student

## 21. Age

15 years

16 years

17 years

18 years

## 22. Grade

10

11

12

13

## 23. What is your primary mode of learning at your school?

Physical

Online

Hybrid

## 24. During the pandemic how many hours were spent on formal class work?

1-2 hours

3-4 hours

5-6 hours

7-8 hours

## 25. How many hours do you spend on formal classwork now?

1-2 hours

3-4 hours

5-6 hours

7-8 hours

26. Which classroom setting did you prefer mainly?

Online

Physical

27. Which would you select to best describe the space you attended virtual classes?

Quiet and distraction-free

Somewhat distracting with occasional disturbances

Very noisy and distracting

28. Are there any of your classes that have remained completely virtual, although school has returned to a physical setting?

\_\_\_\_\_ (please specify)

29. During the pandemic, what was the greatest challenge you faced with attending classes?

Lack of device

Internet services

Power/ Electricity

Poor teaching styles

Other \_\_\_\_\_ (please specify)

30. What was your average performance in the school's examinations during the pandemic?

Poor

Fair

Good

Excellent

31. Were you able to interact more with your teachers during the pandemic as compared to pre-Covid?

Yes

No

32. Have you noticed a change in teaching styles from your teachers after returning to school from the pandemic?

Yes

No

33. Was it easier to manage your time for studying and completing assignments during the pandemic?

Yes

No

34. Did you have more or less free time during the pandemic compared to before?

Less Free time

More Free time

35. Were you introduced to new teaching methods by teachers in the pandemic, such as recordings and virtual labs?

Yes

No

36. How did those new methods affect your learning?

Improved the way I learned

Very monotonous and boring

I lost attention since it was new

No changes noticed

37. How many teachers returned to the traditional teaching method after returning to the physical classroom post-Covid?

None

1 – 5

6 – 10

11 – 15

16 – 20

All teachers

38. Did you find it easy to incorporate technology in your classes during the pandemic?

Yes

No

39. What changes or improvements do you think would help enhance classroom learning in the post-pandemic era?

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40. What would you recommend to the Ministry of Education, for the improvement of learning post-Covid?

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THANK YOU!

***INTERVIEW SHEET FOR TEACHERS***

Dear teachers,

My name is Riaz Rupnarain, a doctoral student at UNICAF University. As part of my degree, I am conducting research into ‘The Changing Role of Teachers and Teaching Styles in the Classroom of High Schools in Guyana amidst the Pandemic.’

This information gathered is completely confidential and since you have to make no mention of your name or personal information, you remain anonymous. For the questions, please place a tick  in the box of your choice, and where necessary write the option in the space provided.

I have read the foregoing information about this study, or it has been read to me. I have had the opportunity to ask questions and discuss about it. I have received satisfactory answers to all my questions and I have received enough information about this study. I understand that I am free to withdraw from this study at any time without giving a reason for withdrawing and without negative consequences. I consent to the use of multimedia (e.g. audio recordings, video recordings) for the purposes of my participation in this study. I understand that my data will remain anonymous and confidential, unless stated otherwise.

I consent voluntarily to be a participant in this study.

With kind regard,  
Riaz Rupnarain  
Doctoral Student

1. What grade or grades do you teach?
2. What is your status at the school?

3. What subject or subjects do you teach at CSEC level?
4. How long have you been teaching?
5. What is your highest academic qualification?
6. Could you briefly describe your teaching styles during the pandemic?
7. Could you highlight what teaching styles you presently incorporate in teaching?
8. How did the pandemic affect your teaching style?
9. What training did you have to undertake during the pandemic to suit the new classroom setting?
10. Do you incorporate any methodology used in the online setting during the pandemic in the classrooms?
11. If yes, give some examples of these methodologies.
12. Did you face any challenges teaching during the pandemic?
13. If so, how did you overcome these challenges?
14. Do you think the students responded more in the virtual classroom or the physical?
15. On a scale of 1 – 10, how much technology do you incorporate in teaching in the classroom, 1 being none and 10 being a lot?
16. How did the pandemic impact engagement in the classroom?
17. Were students able to have personal engagement during the pandemic?
18. Do you feel the pandemic changed the education system?
19. If so how?
20. What changes or improvements do you believe would help enhance teaching in the post-pandemic era, considering the lessons learned during the pandemic?
21. Is there anything else you would like to share about your experiences as a teacher during the pandemic that we have not covered in the interview?

THANK YOU