

Students at risk of academic failure: Could differentiated instruction be a catalyst for school reform?

الطلاب المعرضون لخطر الفشل الأكاديمي: هل يمكن أن يكون التدريس المتميز
حافزاً لإصلاح المدرسة

by

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of the requirements for the degree of
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Abstract

One of the main motivations and intent for undertaking this line of research is due to the sustained concern around the continuously increasing rates of attrition among students in the Caribbean. A 2020 Joint Select Committee on Human Rights, Equality and Diversity aimed to investigate the impact of current curriculum delivery and other contributing factors on the increased dropout rates in males in Trinidad and Tobago. Upon examination of this report it became increasingly apparent the need to explore the linkages and relationships between students at risk of academic failure (not only males) and the understanding and implementation of instructional differentiation in the teacher population and the corollary this knowledge has to inform bottom up policy reform.

The literature first centres on the definition of students at risk of academic failure from various perspectives and then narrows in on the Caribbean context. Tomlinson's Model of Differentiation was a key theoretical framework on which the study was built as it was a critical connector between the adaptation of classroom practices to students with specific needs (such as students at risk of academic failure). The review then went on to find the possible linkages existing in current literature between classroom practice and how it can inform bottom up policy creation for the purposes of reform.

Using a convergent parallel mixed methods approach the researcher was able to delve into teachers' perspectives around the identification of students at risk of academic failure, their level of awareness and approaches to instructional differentiation, as well as, their beliefs on its ability to inform policy. This was done through a survey and qualitative interviews. The initial analysis of data within the pilot study indicates teachers hold critical insights to facilitate the reduction of student attrition specifically students at risk of academic failure. There is also

evidence which suggests that through the implementation of instructional differentiation for students at risk of academic failure critical insight into general methodologies of retention are revealed and this in itself provides key information needed to inform policy and encourage reform from the bottom up.

Keywords: Education for social transformation; pedagogies; inequality in education; policy reform; transformative education

ملخص البحث

أحد الدوافع الرئيسية لإجراء هذا النوع من البحث يرجع إلى القلق المستمر حول معدلات التسرب المتزايدة باستمرار بين الطلاب في منطقة البحر الكاريبي. ففي عام 2020 تم تشكيل لجنة مشتركة بشأن حقوق الإنسان والمساواة والتنوع والتي كانت تهدف الى التحقيق في تأثير طريقة عرض المناهج الدراسية الحالية والعوامل الأخرى والتي قد تكون أسهمت في زيادة معدلات التسرب بين الذكور في ترينيداد وتوباغو. عند فحص هذا التقرير، أصبح من الواضح أن هناك حاجة ملحة إلى استكشاف الروابط والعلاقات فيما بين الطلاب المعرضين لخطر الفشل الأكاديمي (ليس فقط الذكور) وبين مدى فهم وتنفيذ التمايز التعليمي في مجتمع المعلمين وما قد تفضي اليه معرفة هذه النتيجة والتي من المفترض أن تساهم في تعديل السياسة التعليمية على المستوى القاعدي (أي بين منفذي هذه السياسة)

تركز أدبيات البحث أولاً على تعريف ماهية الطلاب المعرضين لخطر الفشل الأكاديمي من وجهات نظر مختلفة عامة ثم تضيق نطاق البحث للتركيز على الادبيات الخاصة بسياق منطقة البحر الكاريبي. كان نموذج Tomlinson للتمايز إطاراً نظرياً رئيسياً تم بناء الدراسة عليه وذلك لأنه كان رابطاً حاسماً فيما بين أساليب تكييف الممارسات الصفية للطلاب من ذوي الاحتياجات الخاصة (مثل الطلاب المعرضين لخطر الفشل الأكاديمي). ثم انتقلت مراجعة الأدبيات لاستكشاف الروابط الممكنة التي قد تكون موجودة بين الممارسات الصفية وكيف يمكن أن تساعد هذه الممارسات في تكوين السياسات على المستوى القاعدي بحيث يكون الهدف الأسمى والأعم هو اصلاح السياسات التعليمية.

باستخدام المنهجية البحثية المختلطة المتوازنة، تمكن الباحث من استطلاع وجهات نظر المعلمين حول كيفية تحديد الطلاب المعرضين لخطر الفشل الأكاديمي، كما استطاع الباحث أيضا الالمام بمستوى وعيهم بالتمايز التعليمي والأساليب التي يستخدمونها في تطبيقه، وكذلك معرفة معتقداتهم حول قدرة التمايز التعليمي على التأثير على السياسة. فقد تم جمع البيانات لهذا البحث من خلال الاستبيانات والمقابلات النوعية. يشير التحليل الأولي للبيانات في الدراسة التجريبية إلى أن المعلمين يمتلكون رؤى ثاقبة للحد من تسرب الطلاب وعلى وجه التحديد الطلاب المعرضين لخطر الفشل الأكاديمي. هناك أيضاً دليل يشير إلى أنه من خلال تنفيذ التمايز التعليمي للطلاب المعرضين لخطر الفشل الأكاديمي ظهرت بعض الحقائق/التجليات الخاصة بالطرق العامة المستخدمة لجعل الطلاب مستمرين في السلك التعليمي، وهذا في حد ذاته يوفر المعلومات الأساسية اللازمة للتأثير على السياسة وتشجيع الإصلاح على المستوى القاعدي.

الكلمات المفتاحية: التعليم من أجل التحول الاجتماعي. طرق التدريس. عدم المساواة في التعليم؛ إصلاح السياسة؛ التعليم التحويلي

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I initially started this programme not with the intention of completing an entire master's qualification but rather for the sake of having a teaching qualification as I cemented my career in the field of teaching and academia and as such, it was necessary to have at least a post graduate certificate in education. Little did I know that the study of education would have sparked such a powerful interest in the area of social justice in education and a genuine curiosity around the education of underrepresented groups in society.

Essentially this was the beginning of a journey of realisation of which I have many people to be thankful for. Firstly, I would like to thank my family as I believe the core of this love of education has been grounded in the environment of my upbringing where I spent many days of my childhood on the campus of The University of the West Indies likely absorbing the culture of academia – no doubt this has had an impact on where I am now.

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List of definitions and abbreviations

AY	Academic year
ESL	Early school leavers
NEETs	Nether in employment or education and training
OOSC	Out of school children
UIS	UNESCO Institute for Statistics
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNICEF	United Nations International Children's Emergency Fund
Content	"The knowledge, understanding, and skills we want students to learn" (Tomlinson, 2010, p. 15).
Differentiated Instruction	"Classroom practice with a balanced emphasis on individual students and course content" (Tomlinson, 2010, p. 14)
Interests	"Topics or pursuits that intrigue students" (Tomlinson & Allan, 2000, p. 10)
Learning environment	"The way the classroom feels and functions" (Tomlinson & Eidson, 2003, p. 3)
Process	How students come to understand or make sense of the content" (Tomlinson, 2010, p, 15)
Products	"How students demonstrate what they have come to know, understand, and are able to do after an extended period of time" (Tomlinson, 2010, p. 15).
Readiness	Ability levels or competencies for a given subject (Tomlinson, 2001).

Chapter 1: Introduction

1.1 Introduction

‘Education is a fundamental human right’ (UNICEF, 2017 p.2). It is the medium through which children and adolescence are able to ‘grow, develop and gain the knowledge, values and skills they need to reach their full potential, gain economic independence and play an active role in their communities and societies’ (UNICEF, 2017 p.2). UNESCO’s Sustainable Development Goal number four directly calls for the free, equitable and a good quality of education for all children that promotes effective learning outcomes to all children by 2030. In order to achieve such a goal, it is imperative that every child completes school without dropping out along the way. This brings to light children within the current education systems who are at risk of academic failure. Evidence shows the implications both socially and economically of the having an education not only for the individual but for entire societies. The benefits of an attentive education system as outlined by UNICEF (2017) are better lives, better health, greater gender equality, greater social cohesion, greater incomes, more tax leverage for governments, reduced crime and risky behaviour among young people, and a lower burden on social welfare, health and justice systems.

1.2 Problem Statement

The issue of students at risk of academic failure as expected is duplicated in Trinidad and Tobago. A 2020 Joint Select Committee on Human Rights, Equality and Diversity reported on the Male Academic Performance in Public Primary and Secondary Schools in the Parliament of Trinidad and Tobago (Appendix 1). One of its objectives was to examine the impact of

current curriculum delivery and other factors contributing to male academic performance as they constitute a major proportion of the population of students who eventually drop out of the school system. In this report it was conveyed that impeding factors on the performance of students included both school environment and non – school environmental factors. With pertinence to the school environmental factors the one with the most significance to this study was the ‘curriculum and its execution inclusive of teachers, teaching styles and methodologies’ (Parliament of Trinidad and Tobago, 2020 p.3). The report highlighted the challenges with the implementation of differentiated learning styles in these schools as automaticity and teaching to the test are engrained in the culture of teaching in Trinidad and Tobago and a major impediment to the realisation of teaching methodologies that would have an impact not only the performance of students but the performance of academically at risk students. According to this report other aspects which impede the development of differentiated instruction include teachers’ reluctance to teach students who are not immediately receptive to traditional instruction.

Where this report ends, this study begins whereby the findings of this report alludes to but does not directly address the existence of students at risk of academic failure. Whilst it highlights the possible merits of differentiated instruction, there is no insight into teachers’ ability to first understand or implement this practice. Furthermore, one must ask the question - Does it end with differentiated instruction or is there the ability to inform reform through a bottom up approach.?

The reality is, there are clearly deficiencies in the literature that fails to address a sufficient understanding of ‘at risk’ students may it be male or female from three perspectives (i) how they are identified in the system by teachers (ii) the perceptions of the use of differentiated

instruction especially on 'at risk' students and (iii) how education cultural in Trinidad and Tobago has affected this grouping of student. Moreover, there is no specific mention of the role of teachers when considering what is needed to build teacher effectiveness and thereby curb the incident of 'at risk' students in earlier stages of academic life. As such broadly speaking, this study aims to address this problem by providing some insight into the issues that arise in the identification of 'at risk' students, the implementation of differentiated instruction in this specific category of students from a teacher's perspective (looking into the education culture at the teacher level) and in doing so looks into what linkages can be made between differentiated strategy for at risk students and school reform. Through the unravelling of this complicated and at times thorny scenarios and environments, it becomes abundantly apparent that the results of this study directly contributes to the realisation of many of the pillars of national development the most significant being the building of human resource capacity in pursuit of national sustainable development.

Whilst students who do not perform or are expected to not perform well within an education system are described as being 'at-risk', the term is often thrown about without it being specifically defined. How is it known what group of students are being referred to and in what context their situation can be addressed? Within this research paper the aim is to properly define the parameters of 'at risk' and seek to address instructional differentiation in these confines. This would be primarily investigated from a teacher perspective by documenting their experiences and attempts at differentiated instruction in the classroom.

In the end it is hoped the following is achieved (i) to be able to define and describe the most prevalent groups of at risk students in Trinidad and Tobago (ii) investigate the existence and application of instructional differentiation for at risk students through teacher responses and

(iii) through teacher perspectives, determine if instructional differentiation could initiate a road map for school reform in Trinidad and Tobago.

1.3 Purpose of the study

One of the main motivations and intent for pursuing this line of research is due to gaps in knowledge that exist with regards to the treatment of academic at risk students through curriculum differentiation with specificity to the Trinidad and Tobago context. The other is to explore the links between instructional differentiation and school reform. This is especially so for small island states such as Trinidad and Tobago where there is an adoption of post-independence British curriculum which according to London (2002) still exists to this day. Whilst it was developed to serve some of the needs of the indigenous people, it was majorly established to serve the needs and aspirations of colonisers and no tangible school reform has occurred to reflect the requirements of modern Trinidad and Tobago.

A convergent parallel mixed methods research design will be used, it is one where both quantitative and qualitative data is collected, analysed separately and then merged so that correlations can be identified to form a holistic picture (Creswell and Creswell, 2018). In this study quantitative data will be used to show the dropout rate at both the primary and secondary level, the ability of teachers to identify the risk markers that are the most reliable predictors of students at risk of academic failure and their level of understanding and ability to implement differentiated instruction for students at risk of academic failure. The qualitative data will explore the perceptions of teachers of the ability of differentiated instruction coupled with an understanding of students at risk of academic failure in informing bottom up education reform. Collecting both quantitative and qualitative data will aide in

developing a complete understanding of the research problem (Creswell and Creswell, 2018) as it does entail the examination of multiple variables and making the linkages among them.

1.4 Research Objectives

The main objectives identified for this piece of research are as follows:

- (i) To acknowledge the existence of 'at risk' students in Trinidad and Tobago classrooms and teachers' ability to identify this category of student.
- (ii) To identify the level of understanding and implementation of instructional differentiation available to 'at risk' students.
- (iii) To explore if instructional differentiation for at risk students can lead to or be purposely linked to bottom up school reform.

1.5 Research questions/sub questions

Leading on from the research objectives the following research question were formulated:

Central research question

- (i) Are teachers able to identify the risk markers of students at risk of academic failure and implement differentiated instruction in an effort to improve the academic outcomes of students at risk of academic failure? In turn, can these methodologies inform a bottom up approach to educational reform.

Sub questions

- (i) How equipped are teachers in identifying students at risk of academic failure?
- (ii) What is the current understanding of differentiated instruction?

- (iii) How are current 'student at risk' policies actually played out in terms of pedagogical practices (the instructional approach – understanding of differentiated instruction) and lesson development in the classroom - teachers' perspective? (implementation of differentiated instruction)
- (iv) Can the ability of teachers to identify students at risk of academic failure coupled with an ability to understand and implement differentiated instruction inform a bottom up educational policy?

1.6 Delimitations

This study works within specific boundaries that allows the research to make certain generalisations which would be further discussed in the results and put into context when we move onto the discussion section. It must be noted that this study is set within the context of the Trinidad and Tobago education system and not that of the wider Caribbean even though many circumstances and contexts were replicated throughout the English speaking Caribbean or rather former British colonies.

1.7 Significance and importance of the study

Having outlined the above, the output of this study has tremendous implications for a number of stakeholders in the education sector of Trinidad and Tobago may it be teachers, policy makers, technocrats or the students themselves.

The findings of this study adds to the scholarly research and literature in this field by shedding new light in terms of the factors at both a micro and macro level that impede the effective implementation of differentiated instruction. There seems to little knowledge or rather little collective knowledge of what happens in Trinidad and Tobago classrooms as a setting differing

from that which occurs in a global context taking into consideration cultural and historical factors. In the classroom due to issues around understanding and implementation as well as different teacher characteristics we begin to see that having general knowledge around this issue or knowing that a diverse class room exists is not enough. At the end of the day an environment in which students at risk of academic failure have the ability to thrive is the optimal end position. From a policy position it draws on a greater understanding of the issues around at risk students from the perspective of teachers so more purposeful networked policies could be written taking into consideration all actors in the system.

Chapter 2: Literature Review

2.1 Introduction

The purpose of this chapter is to establish familiarity with and an understanding of the theoretical structures, relevant and current areas of research around the students at risk of academic failure, differentiated instruction and the formation and implementation of bottom up policy. Through analysis and synthesis of the literature that exist both in a Caribbean and global context among these three variables, linkages are made and an appropriate conceptual framework emerges through which the results will be analysed.

2.2 Laying the Groundwork - Historical context of the Trinidad and Tobago education system

Trinidad and Tobago historically has had an elitist and exam-oriented education system where it has excluded certain sectors of the society from receiving an education that is due to them which it inherited from past British colonial rule (De Lisle, Seecharan, Ayodike, 2010). Educational structures in elitist systems are designed to select and sort students (Heyneman, 1987; 2004) as opposed to inculcating a culture of 'no child left behind'. The origins of these systems stem from colonial and postcolonial educational systems which is aptly explained by Apple (1995) as having an underlying theme of power, control and school knowledge where the practice of hegemony was widely accepted as a means of subtle control of certain sectors of the society. This was corroborated on by Drayton (1997) when it was said that Trinidad and Tobago at the time of British occupation clearly illustrated how education was used as 'an agent of the political process'. In the era that bridged colonial and post-colonial education the focus according to Drayton (1997) to a large extent was not developed to serve the future needs of Trinidad and Tobago but rather was designed to suit the situation that existed. As

such there was an emphasis on agricultural and vocation training as opposed to the academic options which enabled and perpetuated a 'slavery mentality'. Drayton (2007) again reports that attempts were made by in the 1930s to shift the education system to cater for what at the time was a budding petrochemical industry but the ideas were heavily criticised as lacking merit even though that was not the case. Regional education systems have historically followed the British model and its effectiveness is not measured on its ability to serve the needs of the nation but rather compared to its likeness to the "mother country" model.

The question then arises as to the long term repercussions of the retention of such elitist systems on modern Trinidad and Tobago, it's contribution to the development of students at risk of academic failure and the reform needed to bring about change. This is partially answered independently in four ways:

- (i) through statistics reported by global agencies;
- (ii) national statistics;
- (iii) local investigative reports coming out of the school districts and
- (iv) an analysis of a Longitudinal Study of Young People in England

According to The UNESCO Institute for Statistics (2020) the Caribbean and Latin American region accounts for the third highest regional attrition rates at the primary and secondary level only behind Sub-Saharan Africa and Southern and Western Asia. National reports indicate, in 2003 'According to the Ministry of Education's 2002/2003 statistical digest: *Common perceptions [of secondary education] include relative educational underachievement of males, socio-economic and ethnic imbalances with respect to attainment and dropout rates, increasing elitism, widening of gaps in earning potential and possible links with deviant or criminal activity*' (MOE, 2004, p 58). In addition to this the

Trinidad and Tobago Guardian newspaper reported in 2019 that over the course of the period 2012 to 2019 a total of 5074 students had dropped out of the educational system with the reasons highlighted as being under performance in the class room, lack of financial resources to attend school, teachers not engaging students enough, poverty and students choosing jobs over education. Strand (2012) in his study on The White British-Black Caribbean achievement gap: test, tiers and teacher expectations indicate that Black Caribbean students are significantly underrepresented in the higher tiers of educational attainment as compared to their white counterparts.

On a national developmental level, the repercussions as stated by De Lisle, Seecharan and Ayodike (2010) now overlaps into the possibility of generating ‘a low-quality and unequal workforce, incapable of the innovation, production and creativity’ as outlined in the national vision. The consequence of allowing such systems to persist is a population whereby few are well educated and skilled with many being unskilled with the distribution of wealth also be skewed in a similar manner.

2.3 Theoretical framework

This study’s foundation lies in the construction of an adequate theoretical base which supports the rationale of the study, the problem statement, the purpose, the significance and the research questions (Grant & Osanloo 2016). As such it is anchored in the theory and discussion around its three key variables: (i) the identification of students at risk of academic failure, (ii) differentiated instruction and (iii) bottom up education policy as a means of social transformation. The researcher’s choice of theory or at times theories is based on the nature of theory, if it provides sufficient structure to the study and if it provides a common world

view or lens through which the problem statement and analysis of data of is supported (Grant & Osanloo 2016).

Part I: Students at risk of academic failure

2.4 Who is at risk for failure? -Defining and identifying students at risk of academic failure

2.4.1 Overview

When considering students at risk of academic failure the literature is very fickle in terms of distinctively factors that define this grouping of students (Rumberger, 1987). As a result, students at risk of academic failure has been defined in the literature in a number of ways based on the context and circumstance which is being explored.

According to The UNESCO Institute for Statistics (2016) it is estimated that 61 million children of primary school age, 60 million young adults of lower secondary school age and 142 million children of upper secondary school age are not present in school. It is reported that often these children come from the most socially marginalised communities inclusive of children with disabilities, children for ethnic – minority backgrounds, children in countries where gender bias is prevalent and children living in extreme poverty.

There is seldom a singular reason that leads to the classification of being a student at risk of academic failure. More often it is a conglomeration shaped by a multitude of factors which are complex, contextual and dynamic. One might believe that these issues are solely based on the individual or related to the familial characteristics and circumstance but evidence shows that external factors at the school, community and national level have an impact on the creation of students at risk of academic failure. The literature with respect to the external factors comments on weaknesses in school environments and practices, social welfare

systems, policies on youth and employment and of course social and cultural norms that at times prohibits the effective distribution of education across gender. To look at both family and structural factors together is it usually an instance of students falling into this categorisation as a result of family and individual circumstances, however school structure and systems also fail students or are unable to adequately respond and rectify these situations so as to not lead to at risk classification.

Part one of the literature review firstly seeks to present a range of statistics included in the literature with regards to students at risk of academic failure and secondly present, compare and contrast the alternative models present in the literature in the determination of what constitutes a student at risk of academic failure. An assessment of these models is required as it ultimately determined the basis of who we 'count' as being at risk of academic failure.

2.4.2 Review of the range of indicators regarding risk factors

Table 2.1 Overview of the range of risk indicators included in the literature

Risk Indicator	Source
<i>At risk factors at the kindergarten level occur due to limited skills including academic and self-regulation skills</i>	Stormont, Beckner, Mitchell, & Richter, 2005
<i>One in five children have social, emotional and behavioural problems making them at greater risk of failure</i>	World Health Organisation, 2004
<i>ECCE children with both academic and social behavioural problems are at greater risk of academic failure than children with only one risk characteristic</i>	Darney, Reinke, Herman, Stormont, & Ialongo, 2012; Reinke, Herman, Petras, & Ialongo, 2008
<i>Children whose risk factor progress beyond third grade have little chance to not ever have behaviour problem which put them at greater risk of academic failure</i>	Walker, Ramsey, & Gresham, 2004
<i>Attention Deficit/Hyperactivity Disorder (ADHD) affects approximately 5% of any population. These children are at risk of long term impaired social skills, peer rejection, low academic achievement and attrition</i>	Stormont, 2001; Zentall, 2006

<i>Children who come from families that meet the criterion for poverty are at risk</i>	U.S. Census Bureau, 2013
<i>Children who are homeless are at risk of greater academic and social problems</i>	Davey, 2004; National Center on Family Homelessness, 2011; Stormont & McCathren, in press

2.4.3 The risk model

The concept of risk draws on the notion that ‘exposure to particular conditions or risk factors, increase the likelihood that an individual will experience certain adverse consequences’ (Finn and Rock, 1997). In terms of academic outcomes, the concept of risk is based on historically accepted characteristics or status factors associated with academic difficulty or premature exclusion from the school systems. According to researchers these factors are based intrinsically on a range of characteristics and the ability of a student to display academic resilience. It is argued by some researchers that the actual factor or characteristic (e.g. coming from a low socioeconomic bracket in society or from a minority group) is not the sole contributor to the eventual outcome of classification of being a student at risk of academic failure, as many students who do fall within these parameters do go on to succeed. Rather it is the behaviours that are associated with these risk factors that make this group vulnerable to eventual failure.

A substantial body of research establishes connections between status characteristics and risk behaviour which cannot be ignored by this research. This is a crucial bridge through which defining and identifying students at risk of academic factors could be established. It is well documented by Finn, Folger & Cox, 1991; Finn, Pannozzo & Voelkl, 1995; Lamborn, Brown, Mounts & Steinberg, 1992; McClure, 1978; Trueba, 1983 that students of minority groups participate less fully in learning related activities within the classroom, as such there is a greater chance of behaviour problems (Bennet & Harris 1982; Farkas, Grobe, Sheehan &

Shaun, 1990; McFadden, Marsh, Price & Hwang, 1992; Us Office of Civil Rights, 1992; Velez, 1989) which puts them at greater risk of being a student who will eventually fail. As such the importance of this to this study lies in the fact that when considering students who are at risk of academic failure there are two overall characteristics that need to be considered - the first being their level of engagement in learning activities and their ability to be resilient as it related to self-esteem and locus of control.

2.4.4 The application of epidemiological frameworks to students at risk of academic failure

Alternatively, the literature presents a multitude of perspectives through which the identification of students at risk of academic failure can be examined. The examination of The Epidemiological Framework and the study of academic failure is another lens through which this issue can be considered. In an effort to study the prevalence of diseases in specific populations, epidemiologist have developed a framework which centres on the examination of both biological and environmental risk factors which contribute to either an increased or decreased instance of the disease or the development of preventative measure to mitigate the risk of the occurrence of the disease. However, the application of this model due to its ability to assess the vulnerability of certain populations has had unconventional applications in the social and behavioural sciences. It has been found to be effective in the study of problematic behaviours at both the individual and societal level and the examination of issues such as delinquency, divorce and alcoholism (Gramezy and Masten, 1986). The usefulness of the epidemiological application lies in its ability to translate risk factors to identifiable traits, behaviours, interpersonal relations or special conditions that are associated with the greater risk of poor social outcomes (Gramezy and Masten, 1986; Jessor et al, 1985; Masten, 1994; Price and Lento, 2001). Out of these alternative applications a hybrid of the original model

was developed where it is an 'interplay of risk and protection in general human development' and is referred to in the literature as the *social epidemiological framework*.

The relevance of applying this framework to the study of students at risk of academic failure lies in its ability to identify possible risk or mitigation factors as is related to students at risk of academic failure. The model identifies three distinct categories which contribute to the identification of students at risk of academic failure those being: family risk factors, peer risk factors and economic risk factors. This categorisation occurs numerous times in education research as the factors which contribute to academic failure (Scheider and Coleman, 1993; Steinberg et al 1996). However, one of the main critiques of this model is the lack of attention given to physical and mental health problems and its contribution to student performance specifically at the secondary school level (Needham, Crosnoe & Muller, 2004). This is based on the research done in adult populations where it shows that mental and physical health affects work performance (Dewa and Lin, 2000). As such, it is argued why this is not the same for adolescent population where there is some measure of equivalence between the workforce for adults and education systems for adolescence. Moreover, through the examination of smaller populations, social epidemiological studies have found that physical and mental health are significant factors that impair academic performance (Field, Diego and Sander, 2001; Thies, 1999).

Bearing all these considerations in mind the application of the social epidemiological framework to the identification of students at risk of academic failure is none the less relevant and duplicated many times in numerous studies for the purpose of defining and identifying students at risk of academic failure. As such, the model identifies important family/economic risk factors as being: 'low socio economic status, being born to a teenage mother, living in a

single parent family and experiencing higher than average levels of stressful change such as parental divorce or death (Alexander, Entwisle, and Kabbani 2001; Crosnoe, Mistry, and Elder2002; Pungello et al. 1996). Peer factors include – associating with deviant peers and feeling rejected by other students (Kaplan et al 1997).

2.4.5 Early Warning Systems for student at risk of dropping out (UNICEF/UNESCO Institute of Statistics)

UNICEF in collaboration with UNESCO’s Institute of Statistics established its Early Warning Systems for students at risk of academic failure in an effort to support out of school children as a first step in ensuring children are able to access their right to an education. It is essentially a system aimed at supporting countries in the identification of children who are at risk of academic failure and by this it is meant children who are at risk of dropping out of school by promoting and implementing appropriate policies that address this sort of exclusion. The systems conceptual and methodological framework first introduces the five dimensions of exclusion then goes on to establish an eight step monitoring framework for out of school children and children at risk of academic failure. These two components are shown below:

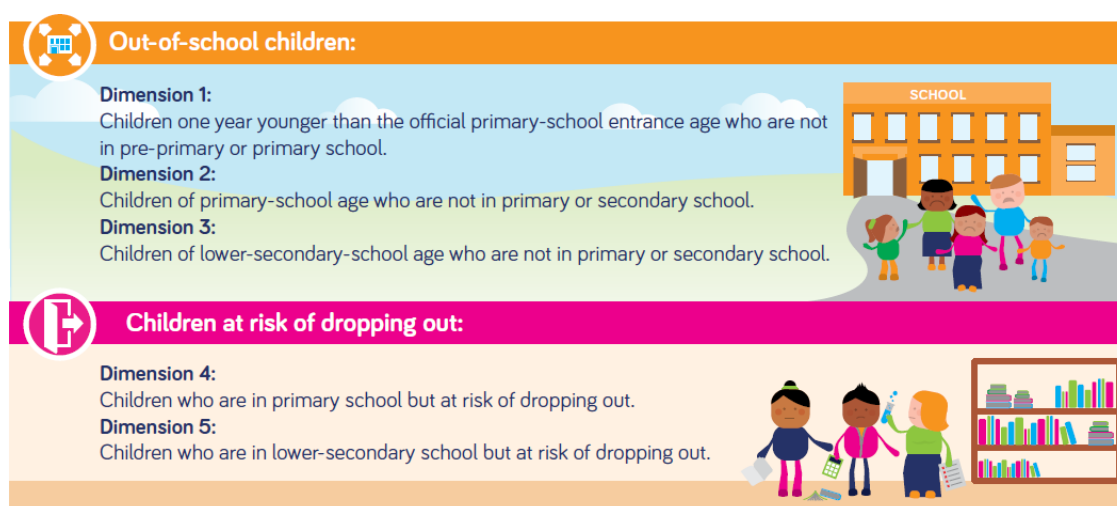


Figure 2-1 The five dimension of exclusion

Source: UNICEF and UIS, 2011; UNICEF and UIS, 2016

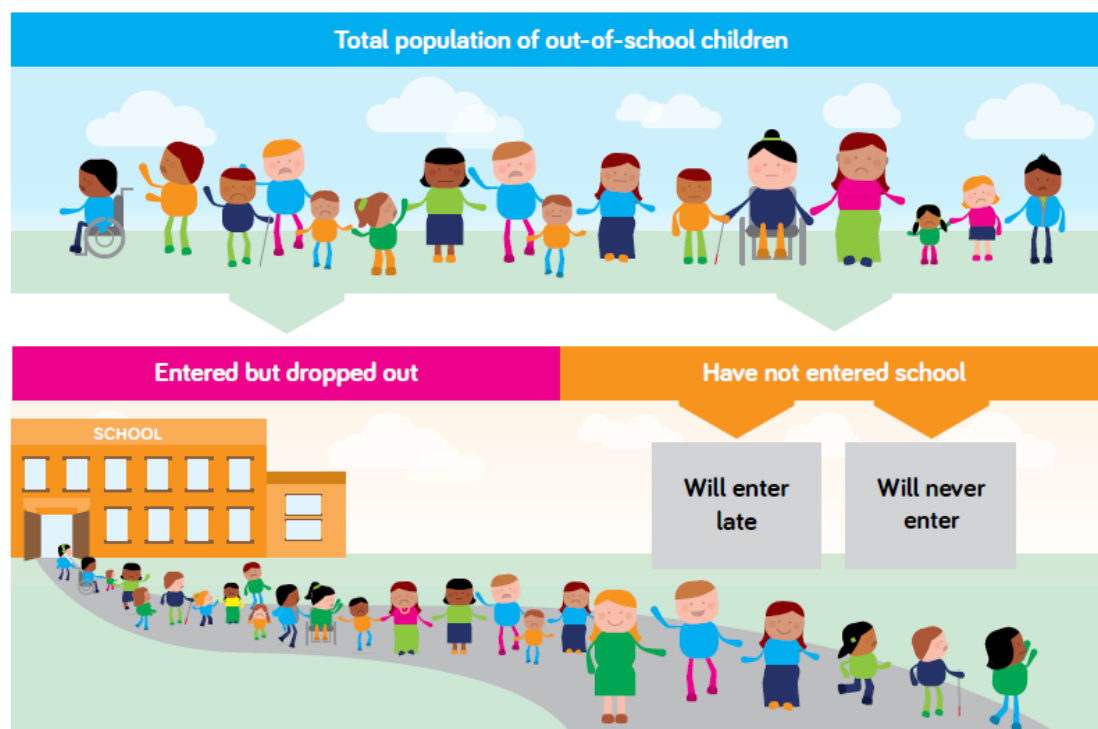


Figure 2.2 Classification of the out of the out of school population by school exposure

Source: UNICEF and UIS, 2011; UNICEF and UIS, 2016

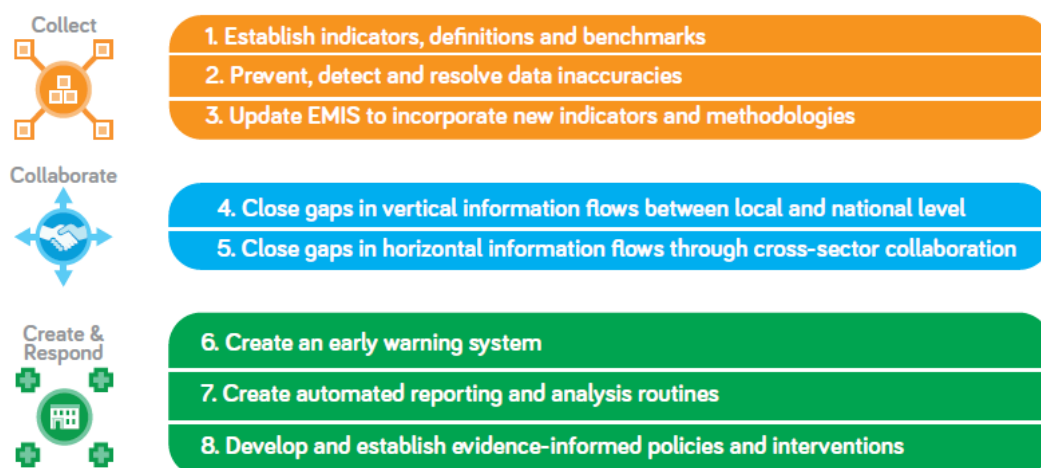


Figure 2.3 Eight step monitoring framework for out of school children at risk of academic failure

Source: UNICEF and UIS, 2011; UNICEF and UIS, 2016

This study is not concerned with the entire framework but rather with specific components around the broadly identified dimensions of students who are out of school and students who are at risk of dropping out of school (students at risk of academic failure (The five dimensions of exclusion and the classification of school population by school exposure) and secondly step one of the monitoring framework that establishes indicators, definitions and benchmarks.

According to UNICEF and UIS, 2011; UNICEF and UIS, 2016 the term exclusion can be interpreted in different ways in accordance to the contextual situation of the population concerned. In the first instance it means children who are out of school are excluded from education and secondly children who are at risk of academic failure are also excluded due to the fact they are likely to face discriminatory practices or interactions within the school system (Figure 2.1). In addition, the model differentiates between those who have previously entered school and subsequently left the school system and those who never entered the school system (Figure 2.2).

The eight step monitoring system diagrammatically shown in Figure 2.3 presents the framework for monitoring both categories of student. The aim of the first step is to establish appropriate parameters with which key concepts and proposed definitions can be used to develop the robust monitoring system of both categories of student – out of school children and at risk of academic failure children. The establishment is based on the reality that many times indicators and data available on these students are unavailable (meaning data on both categories of student are unavailable), incorrectly defined (for the indicators that are available the definitions or methods of calculation are not correct) or inconsistently interpreted (data and their definitions are unclear and the interpretation between data from various bodies is not consistent or accurate) or insufficiently disaggregated (the data cannot

be broken down into smaller units to make analysis meaningful). As such this step requires an in depth analysis and clarification of the various methods through which both categories of student are measured and distinguishing features established. As such the literature explains there is a need to 'distinguish between different approaches to measuring OOSC, clarify the differences between OOSC and the Eurostat concepts of early school leavers (ESL) and young people neither in employment nor education and training (NEETs), and finally to establish consistent and complete definitions of truancy, dropout, late enrolment and OOSC relevant to the national context' (UNICEF and UIS, 2011; UNICEF and UIS, 2016).

Based on the above interpretation this model defines a criterion which must be considered when defining students at risk of academic failure. The considerations being:

- (i) A consideration of the compulsory school age range according to law of which dropout rates and OOSC can be clearly classified.
- (ii) The reporting requirement through which school are required to submit both enrolment and dropout information
- (iii) A specific classification of what kind of absenteeism is considered consistent with student at risk of academic failure.
- (iv) Education programmes that would and would not be considered in the at risk calculation.
- (v) A clear list of conditions that are excluded from dropout rates and at risk classification e.g. migration, transferring to other school programmes, sickness which requires long term hospitalisation and death.

Based on the above it would be seen that each educational district will develop its own criteria and not be bound to a universal definitions of students at risk of dropping out or students at risk of academic failure.

PART II: Differentiated Instruction

2.5 Tomlinson's model of differentiated instruction

2.5.1 Overview

This second part of the literature review would essential seek to answer three keys questions: What is differentiated instruction? Why use differentiated instruction? And how does differentiated instruction interact or improve the outcomes of students at risk of academic failure? It does this by first establishing the meaning of key terms used in the explanation of differentiated instruction, providing historical perspectives, delving into differentiated instruction and the key model used in the study and lastly its application to students at risk of academic failure.

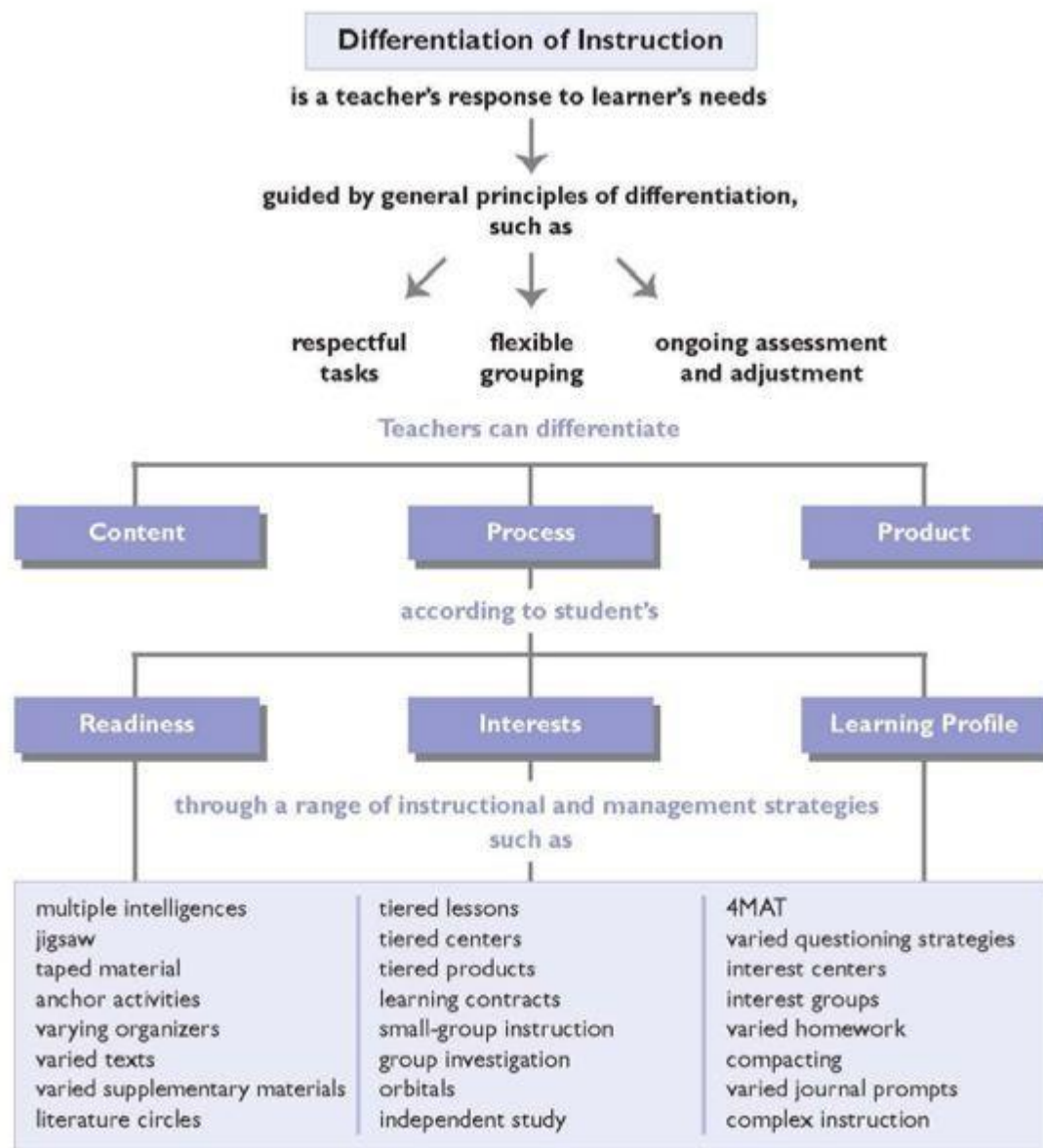
2.5.2 Historical perspectives of differentiated instruction

While the theory of differentiated instruction is not necessarily new, its use in main stream education was popularised by Tomlinson in the United States in 1999. The author's book titled Differentiated Instruction was published in response to dealing with mixed ability classrooms. Since then there have been increasing use of the concept worldwide particularly to address the issue of student diversity and its application to various contexts have been seen globally. According to Heng and Song (2020) most of the studies published in this area have sort to address and revolve around the efficacy (Brighton et al. 2005; Chien 2012; VanTasselBaska

et al. 2008; Wertheim and Leyser 2002) and implementation (Brighton et al. 2005; Chien 2012; Mills et al. 2014; Ritzema et al. 2016; Strogilos et al. 2017, VanTassel-Baska et al. 2008).

The concept of differentiated instruction emerged out of educational theorist Howard Gardner's theory of multiple intelligences together with more modern theories on brain compatible research (Gardner, 2006; Goleman. 2006; Moran, Kornhaber, & Gardner, 2006: Sousa & Tomlinson, 2011; Tomlinson, 1999). Its emphasis lies in the underlying notion of a diverse array of learning styles included in one classroom. Tomlinson particularly emphasizes that whilst in any particular group of students there is likely to be a variety of learning characteristics, the need for a variety of learning activities in general classroom is more necessary where there are students with learning disabilities, learning disorders and/or any factor that contribute to their inability to learn effectively inclusive of students at risk of academic failure. With a backdrop of diversity in learning as a key consideration, Tomlinson in her writings encourages teachers to understand and implement the personalisation of instruction in the classroom in an effort to stimulate students with highly interactive, challenging and interesting classroom material. Tomlinson (1999) also posits that teachers should always aim to consider the individual learning styles of students and adjust their classroom activities to cater to this and any divergent learning styles. The main goal of differentiated is to 'maximize the learning potential of each student' (Tomlinson, 2001, 2003, p. 263).

2.5.3 The Tomlinson model



Reprinted by permission from *The Differentiated Classroom: Responding to the Needs of All Learners*, by C.A. Tomlinson (Alexandria, VA: ASCD, 1999). The Association for Supervision and Curriculum Development is a worldwide community of educators advocating sound policies and sharing best practices to achieve the success of each learner. To learn more, visit ASCD at www.ascd.org.

Figure 2.3 The differentiated classroom: Responding to the needs of all learners

Source: Tomlinson (Alexandria VA: ASCD, 1999)

The above diagram pictures Tomlinson's model of differentiated instruction produced out of her 1999 research on said topic. Of particular interest to this research is the two distinct areas in which differentiation can take place. Those being teachers can differentiate according to

readiness, interest and learner profile through the differentiation of content, process and product.

In accordance with the writings of Suban (2006) student are different in three critical ways – in terms of readiness, interest and learn profiles. When it comes to differentiate classroom it is incumbent upon the teacher to understand these differences and cater to these differences to maximize the learning potential of each student in that classroom (Tomlinson, 2000b, 2001a). It is believed that understanding of student interest can be an effective tool that would support learning in the classroom (Tomlinson, 2001a). It goes on to say that Tomlinson (2001a) sees student interest as a major motivator in the classroom, this corroborated by MacGillivray and Rueda (2001) when it is said that by having a good understanding of interest teachers are involving their students in the daily running of the classroom and as such become more meaningful to students (Bosch, 2001; MacGillivray and Rueda, 2001; McBride, 2004; Tomlinson, 2000b, 2001a). More specifically to the scope of this study an important addition was made by Lawrence- Brown (2004) where it was added that if a teacher in a diverse class room setting is knowledgeable about the importance of understanding student interest it is likely that even the marginalized student within the class would find a place and learning occurs.

Differentiated instruction at its core is about student variance and thus allows teachers to implement the concept through the planning of their content and process in support of that variance (Lawrence-Brown, 2004; Tomlinson, 2001a). The advantages of this for students at risk of academic failure is that it fosters opportunity for various types of learning such as group learning as well as independent or individualized learning (Lawrence-Brown, 2004; Tomlinson, 2001a). Tomlinson (2001a) argues that teachers who are aware of the learning

needs of their students are in a better position to help learners make better decision about the way they learn. This again puts the teacher in a better position to choose tasks that enhance the learning experience of the student, create individualized lesson plans and authentic learning experiences.

Readiness an important element of the understanding element of differentiated instruction refers to according to Tomlinson (2000a) the student's ability to effectively receive what is being taught. This comes under the reality that whilst many students may be at a certain grade level this does not necessarily mean that they are of the level of the grade (Tomlinson, 2001a). This has immense implications when speaking about the understanding of readiness on the part of teachers as teachers need to be able to discern the ever change readiness of students and alter their instruction so as it is neither too easy not too difficult (Tomlinson, 2001a, 2003).

PART III: Education reform and policy

2.6 Bottom up education reform and education for social transformation

2.6.1 Overview

One of the priorities of the government of Trinidad since post-independence in 1962 is to provide free and compulsory primary and secondary education to all the citizens of the country. This is in accordance with the proclamation of 'Education for All' made by the United Nations Education, Science and Cultural Organisation – UNESCO 1990,2000) signed by countries around the world. This has left challenges for developing countries aspiring to implement a high quality of education for all their children (Johnstone, 2010).

2.6.2 Education for social transformation or not?

It is often argued that educational systems are one of the integral institutions that foster social transformation for social justice, however the capability of this institution to deliver this transformation is greatly inhibited by the market economy model that is imposed upon it (Sher, M. & King, S., 2015).

Education systems are designed to prepare children and adults to fulfil the requirements needed within society (Subran, 2003). Subran (2003) posits whilst education systems are inherently standardised there are many students who fall outside the realms of this standardisation. This occurs when students fail to learn what is taught, others who refuse to learn and then there are those who learn 'outside the box' of traditional and standardised methods. Inherently due in part to these issues of standardisation and constraints that limit differentiation created is a situation where many are put at risk of academic failure.

2.6.3 'Top-down' or 'Bottom-up' (Wilson, 2020)

'The general logic behind the 'top-down' approach is that a standard set of factors define the main idea of the approach. It aims to define the general theory of implementation. Proponents of the 'top-down' approach such as Mazmanian and Sabatier (1989) aim to justify how implementation of policy under this approach can be successful. They identify three key components that are critical in the development of an effective implementation process: 'tractability of the problem, ability of law to structure implementation, non-statutory variables affecting implementation' (Mazmanian and Sabatier, 1989 p.22). According to Mazmanian and Sabatier there are key precursors and assumptions that are expected to be in place for this approach to be implemented. The precursors include (i) appropriate legislative frameworks to enable the policy to be enacted must be clear and present (ii) The

policy must have clearly defined goals, objectives and policy tools. This approach also works on the assumption that the policy designers have complete knowledge of the capacity of the implementers and the implementing organisations that are expected to carry out the policy. The top down approach builds on the idea that policy makers are the most qualified to create and implement policy objective (Pulzl, Treib 2007). Birkland (2001) probably puts it in the most understandable manner by stating 'in order to accomplish policy goals policy makers have to create a proper structure for control, meaning the values set at the top have to be shared with implementer, the policy delivers on the bottom'. Mazmanian and Sabatier (1989) also stated that a specific set of criteria must be in place for effective implementation (i) clear and concise policy objectives, (ii) there is a causal relationship linking policy objectives to clearly defined target groups (iii) agencies are assigned to carry out specific policy objectives (iv) the implementation policy is carried by skilled people fully committed to implementation (v) the policy has the support of stakeholders and interest group (vi) the policy is not affected by changes in socioeconomic conditions. As with all theoretic frameworks there are inherent weakness that affects its ability to work in the real world.

One of the main criticisms of the top down approach is that it does not take into account broader public policy and in fact acts in isolation as to what may be going on in other sectors of society. Secondly, it ignores the legislative process and how laws are passed, in addition to the fact it places great emphasis on the policy designer and little to none on the local roles who have a clearer understanding as to how policy implementation is to look like. Another fundamental criticism according to Hjern and Hull (1982) is that the formation top-down policy is that it begins from the perspective of the perspective of technocrats, decision makers and as such tends to ignore the actors in the actual execution of policy. This leads to the thought that decision makers are the actors in the process and this is not the case. The result

of this is that often there is neglect of the real issues that play out in the classroom (Sabatier, 1986).

The bottom up approach is built on the philosophy that in order to close the gaps in policy implementation it is better to look at policy implementation from the bottom rather than from the top. They view implementation more holistically and one has to examine the delivery level in order to understand what really goes on and how it would perform in the implementation of policy. Policy implementation using this approach emphasizes policy making is shaped at the recipient level (Lipsy, 1980). The approach actually differentiates between two levels of implementation the first being the macro implementation level where the central decisions are made on policy. There is also a micro implementation level where the implementers customise the policy to meet the macro level objectives. Central planners only influence policy indirectly, therefore the way in which the same national policy is implemented is not always homogeneous and it is thought that if policy is not changed to suit circumstances there is a likelihood policy implementation would fail. In terms of criteria, in contrast to the top down approach there is not set criteria to evaluate the policy objectives but rather it focuses on the interaction between the policy network. Matland (1995) suggests that there are two major criticisms of the bottom up approach. One of these are that policy implementers at the micro level are likely to ignore policy goals and over extend personal goals without any measure of accountability. The other being that this approach places too much attention on the autonomy of the local policy implementers rather than the central government authorities'.

Following on from the presentation of the two approaches of implementation the following table is borrowed from Sabatier (1986) and it would be seen when presenting in the Trinidad and Tobago context an analysis between themes and policy focus can ensue.

Table 2.1 Comparison between top-down and bottom up approaches

	<i>Top-Down (Sabatier & Mazmanian)</i>	<i>Bottom-up (Hjern et al.)</i>
Initial Focus	(Central) Government decision, e.g., new pollution control law	Local implementation structure (network) involved in a policy area, e.g., pollution control
Identification of major actors in the process	From top down and from govt. out to private sector (although importance attached to causal theory also calls for accurate understanding of target group's incentive structure)	From bottom (govt. and private) up
Evaluative criteria	Focus on extent of attainment of formal objectives (carefully analyzed). May look at other politically significant criteria and unintended consequences, but these are optional.	Much less clear. Basically anything the analyst chooses which is somehow relevant to the policy issue or problem. Certainly does not require any careful analysis of official govt. decision(s).
Overall Focus	How does one steer system to achieve (top) policy-maker's intended policy results?	Strategic interaction among multiple actors in a policy network.

Source: Sabatier, 1986

Chapter 3: Methodology

3.1 Introduction

The main aim of this chapter is to unravel and provide adequate justification for the process and research methodology employed to best answers the research questions presented. Although the previous review of the literature shed light on the existing issues and views around students at risk of academic failure, differentiation and its links to education reform - an issue that was also closely monitored was the method by which these studies aimed to reconcile the achievement of the research objectives by way of the research design.

Gettinger and Stoiber (2013) who looked at differentiated instruction with high risk preschoolers where the aim was to determine whether “a curriculum-based approach can be effective in helping teachers to maximize the quality of universal instruction for all students and to provide differentiated support for individual children” – it utilised an evidence-based approach whereby quantitative methods of data collection was utilised by way of observations in experimental and controlled classrooms were recorded. Alternatively, Crossfield and Bourne (2018) in their inquiry into teachers’ perceptions of at risk student in Jamaica which aimed to discover how teachers perceive their purpose and how they view their readiness to teach at risk students in schools follows a qualitative methodology designed as a hermeneutical phenomenological approach to explore and understand the underlying issues. Thirdly, Tower et al (2015) who examined engaging, supporting and the retention of at risk nursing students with the objective of examining and tracking the critical risk markers associated with attrition rates so as to implement timely interventions utilised both quantitative and qualitative research methods by way of a survey designed around the use of the Lizzio’s lifecycle-informed approach to student transition followed by the use of telephone interviews to further corroborate data collected.

Having looked at these studies in similar areas around at risk students, differentiated instruction and reform it becomes apparent that the research design needed for this study required an amalgamation of different methods to achieve the aims that have been set out. As such this is in keep with the general rule that research design is not governed by a single template but rather is 'fit for purpose' and driven by the purpose and the realisation of the research aims (Cohen, Manion and Morrison, 2005). With this in mind, this research will take a tripartite approach where a combination of secondary data, surveys and interviews will be utilised to arrive at some solid results and conclusions.

3.2 Research Philosophy

According to Slife and Williams (1995) philosophical underpinnings in research whilst mostly hidden, still play a major role in the practice of research. The manner in which a researcher views the world or develops an understanding of their discipline influence the thought processes, the type of research and the manner in which a researcher carries out research. The literature on research philosophy includes four broad world views or beliefs that a researcher brings to their inquiry. These are: post positivism, constructivism, transformative and pragmatism with the most common of these being post positivism. The positivist views research in the most tradition of ways and seek scientific methods to resolve research questions. They generally do this through the use of quantitative data. Post positivists have challenged this view by challenging the notion of the absolute truth of knowledge (Phillips & Burbles, 2000) as it is believed that when dealing with human behaviour the issue of absolute becomes skewed. This piece of research certainly has element of a positivist world view specifically when it comes to the testing of the existence of students at risk of academic failure through clear parameters. Positivist views are also evident but probably a bit less definitive when it comes to the testing of hypotheses as it does seek to measure understanding on

one hand and implementation on another which could be subjective. This brings to the forefront the role constructivism or social constructivism has to play in this research and this is most applied to the fourth research question where qualitative data is collected. According to Creswell and Creswell (2018 p. 8) 'social constructivist believe that individuals seek understanding of the world in which they live in'. As a result of this their interpretation of event different and they attach different meanings to different events. This leads the research to analyse the complexity of the issue rather than narrow these issues to a few categories or absolute outcomes. Constructivist research revolves around open ended questions and finding meaning in the multitude of responses.

3.3 Research Design

A convergent parallel mixed methods research design will be used to collect, analyse and interpret quantitative and qualitative data.

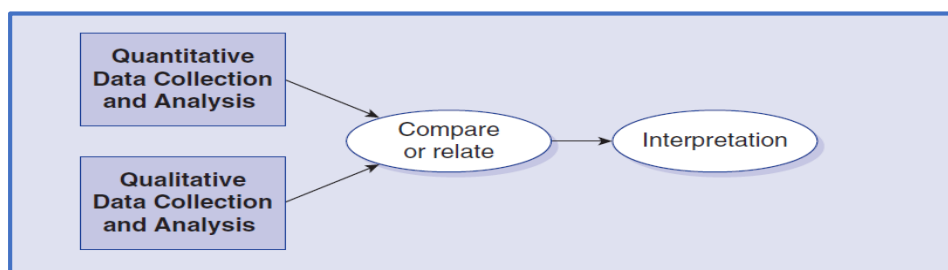


Figure 3.1 Convergent parallel mixed methods

Source: Creswell and Plano Clark, 2018

According to Creswell and Creswell (2018) a convergent parallel mixed methods design is a one step process by which both quantitative and qualitative data is collected concurrently, the results are merged and then compared in an attempt to answer the research questions. This classification of mixed methods design according to Tashakkori and Teddlie (1998) is well suited to educational research particularly as it relates to social and behavioural research (Tashakkori and Teddlie, 2003b) which is essentially what this study is trying to establish –

teacher practices and behaviour in the classroom. When looking at the research questions, the researcher is trying to find linkages between three key themes – students at risk of academic failure, differentiated instruction and bottom up policy reform. This type of mixed methods approach helps with this in three main ways:

- (i) **Triangulation** – There was a need for the convergence, corroboration and correspondence of different types of data that can only be achieved by utilising a mixed methods approach (Greene, Caracelli and Graham, 1989). This would become apparent when the research questions are reviewed and the researcher makes clear the type of information that is collected and how it answers the central research question.
- (ii) The ability to **confirm and discover** through the use of qualitative data is key to this study as many elements speaks to first confirming and then discovering more detailed facets of the problem (Bryman, 2006).
- (iii) A mixed method approach allows for the revelation of a **diversity of views** (Bryman, 2006), through the collection of qualitative and quantitative data exposing relationships and meaning between variables. Again this is central to this study as it key intent is to find linkages of the three main themes.

Convergent parallel mixed design allows for the realisation of objectives of this study through its inherent characteristics – concurrently conducts qualitative and quantitative elements in one phase, weighs the methods equally, analyses the data set separately and interprets the results together (Creswell & Pablo-Clark, 2011). Putting this into the context of this study, it allows the researcher the ability to concurrently collect quantitative and qualitative data all

of which has relevance to answering of the research question (the research questions, the data and how the data answers the question are discussed in 3.3.3).

3.2.1 Revisiting the research questions

The central research question is stated in a layered manner, as such, it first asks if teachers are able to identify the risk markers of students at risk of academic failure. This is supplemented in the sub questions by stating - How equipped are teachers in identifying students at risk of academic failure? This is the first piece of data required. The research design answers this in two ways. The first being it looks at secondary quantitative data to confirm that students at risk of academic failure are indeed a phenomenon worth highlighting. The second part zeros in on their ability to recognise the risk markers in existing students by again collecting qualitative data and comparing it to already established data in an effort to determine the accuracy of teachers in determining the specific risk factors that lead to attrition.

3.2.2 Participants

According to the statistics from the Central Statistical Office of Trinidad and Tobago there are 6801 public secondary school teachers and 5665 primary school teachers. From this population the sample collected responses from 106 teachers from both primary and secondary schools. Participants were selected using a non-probability voluntary response method, whereby teachers volunteered themselves instead of the researcher selecting individuals. This was carried out by sending an incentivized email using the Pennacool.com online database of teachers and in turn teachers responded. This platform collectively includes over 2000 teachers at both the primary and secondary school level. The selection of this database ensured that the teachers selected came from an official database and are currently practicing teachers at both the primary and secondary level.

The demographic characteristics included both male and female teachers aged from 21 to 60 plus. The subject areas ranged from English language, mathematics, science based subjects, foreign languages, principles of business, principles of accounts, music, religious knowledge etc. Teacher who taught both general and special education responded. Geographically, the schools were located through all the education districts of Trinidad and Tobago namely Port of Spain, St George East, North Eastern, Victoria, St Patrick, South Eastern and Tobago. The education level of participants ranged from secondary school completion certificates to doctoral degrees.

3.2.3 Data collection instruments and procedures

Table 3.1 Overview of the type of data collected and the instruments used

Research Question	Type of data collected	Data collection instruments
R1 (a) - No. of school drop outs	<i>Quantitative</i>	<i>Records (secondary data)</i>
R1 (b) Ability to identify risk markers	<i>Quantitative</i>	<i>Questionnaire (close ended)</i>
R2& R3 Understanding and Implementation of DI for at risk students	<i>Quantitative</i>	<i>Questionnaire (Likert Scale)</i>
R4 Linking DI for students at risk to bottom up reform	<i>Qualitative</i>	<i>Interview</i>

Section A, B and C of the survey questionnaire is a modification of the of the Teacher Self Reflection on Differentiation for Staff Development Planning Survey original developed by Tomlinson. The modifications to the questionnaire was previous approved for modification by Page (2007). The survey was however slightly tweaked for this study, mostly just to reflect the context of the data collection environment. The survey questions adequately correspond with the elements of differentiated instruction needed to answer the research questions.

3.3.3 Data Analysis

In accordance with a convergent parallel mixed methods approach the data will be analysed and compared using three distinct methods. In the first instance the historical secondary data collected used to answer research question 1(a) will be analysed using trend analysis and research synthesis. According to Goel and Singh (2019 p 2) 'trend analysis is the practice of collecting information and attempting to spot a pattern or change in the given information'. Research synthesis refers to the examination of the same data from multiple independent sources in order to extract trends. Both processes are central to scientific enterprise (Goel & Singh, 2019). Without this level of analysis, the ability to form various hypotheses and come to solid conclusions cannot be done thus having implication on the ability to generalize and inhibit its usage to practical implications. Trend analysis can be both quantitative as well as qualitative (Koricheva, Gurevitch & Mengersen, 2013) however in this instance the researcher has used descriptive analysis to comment on similar trends across different data sources.

Research question 1(b) which also collects quantitative data in an effort to determine the ability of teachers to identify risk markers that are in line with the accurate identification of students at risk of academic failure. This analysis takes a comparative approach comparison is made to what has been said in the literature to what actually occurs when teachers were asked to identify what they thought were risk markers for students at risk of academic failure. Again the comparison factors are thoroughly discussed in the results chapter.

Research question 2 and 3 took on a descriptive approach where both correlation and ANOVA were utilised. Excel was used as the primary data analysis software. And lastly research question 4 used thematic analysis based on the interview responses.

3.4 Validity and reliability in convergent mixed methods research design

When using a convergent mixed methods approach such as the one utilised in this study the approach to validity needs to be two pronged dealing with quantitative validity and qualitative validity. One of the issues that is mentioned in the literature is different concepts are applied to quantitative and qualitative data and it is recommended that the same concept or variables be used on both sides (Creswell & Creswell, 2018). This has been addressed in this research as the same variables of study were used throughout the study those being students at risk of academic failure and differentiated instruction. The literature however, does give leeway as the purpose of a convergent mixed methods approach is to justify the existence of a phenomena through both qualitative and quantitative methods and the ability to keep variables constant is not always possible.

3.5 Ethical Considerations

In research, ethical considerations are vital to assure the trustworthiness of both the process and the subsequent content (Creswell, 2007). This proposal was submitted to the university's research ethics committee where it was determined to be low risk. This process ensured that the participants of the survey and the organisations within which they work were protected. Due to the fact that this study relies on the collection of both quantitative and qualitative data certain ethical issues were anticipated by the researcher (Berg, 2001; Hesse-Biber and Leavy, 2011; Punch 2005; Sieber, 1998) and the necessary measures were built into the research design so as to minimise any discomfort for participants. Prior to embarking on the collection of data since the researcher approached Pennacool.com and overview of the research was prepared and given along with a request to collect data from their membership. Once those

permissions were received the researcher also disclosed the purpose of the study, how and where the data will be used to all participants and sought consent to collect data allowing participants to either accept or decline participating in the study (see Appendix 3). In order to protect the identify of participants the researcher also does not require participants to disclose any identifiable information or name of institution. In the analysis of the data it would be made sure that not only positive results are shared but a balanced approach is taken reporting both supporting and contradictory aspects of the data. As stated in the research overview the complied data and results are available to any participant of the research who requests it.

Chapter 4: Results and Findings

4.1 Introduction

The aim of this chapter is to present and describe the primary and secondary data collected.

As described by Matthews and Ross (2010) the purpose of data analysis is to describe, discuss, evaluate and explain data collected in the research process. As detailed in the methodology chapter this research follows a convergent or concurrent mixed methods approach which means quantitative and qualitative data collected in parallel. Although the two forms of data were collected simultaneously, they were analysed separately and then merged to answer the five distinct research questions. The central research question served as an overarching question from which the four sub questions were derived.

This has been restated below:

Central research question

- (ii) Are teachers able to identify the risk markers of students at risk of academic failure and implement differentiated instruction in an effort to improve the academic outcomes of students at risk of academic failure? In turn, can these methodologies inform a bottom up approach to educational reform.

Sub questions

- (v) How equipped are teachers in identifying students at risk of academic failure?
- (vi) What is the current understanding of differentiated instruction?
- (vii) How are current 'student at risk' policies actually played out in terms of pedagogical practices (the instructional approach) and lesson development in the classroom - teachers' perspective? (implementation of differentiated instruction)

- (viii) Can the ability of teachers to identify students at risk of academic failure coupled with an ability to understand and implement differentiated instruction inform a bottom up educational policy?

Table 4.1 Overview of the data collected and the analysis applied to each research question.

Research Question	Type of data collected	Data collection	Data Analysis
R1 (a) No. of school drop outs/repetition rates /academic performance	<i>Quantitative</i>	<i>Records for the period 2012 to 2019 accessed through the Trinidad and Tobago Central Statistical Office (public information)</i>	<i>Descriptive analysis based on secondary data</i>
R1 (b) Ability to identify risk markers	<i>Quantitative</i>	<i>Questionnaire (close ended)</i>	<i>Descriptive analysis based on secondary data</i>
R2& R3 Understanding and Implementation of Differentiated Instruction for students at risk of academic failure	<i>Quantitative</i>	<i>Questionnaire (Likert Scale)</i>	<i>ANOVA and descriptive analysis</i>
R4 Linking Differentiated Instruction for students at risk of academic failure to bottom up reform	<i>Qualitative</i>	<i>Interview</i>	<i>Thematic analysis</i>

The aim of this stage of the research is to establish some measure of integration where the qualitative and quantitative findings find coherence (Fetter et al. 2013). This chapter presents the findings in a manner that follows the lead given by the research questions looking at each one in turn, where by the end a full picture would be established and then further analysed in the discussion chapter. This chapter also presents the rationale behind the data analysis in an effort to provide seamless explanations as to why things were done in a certain manner.

This would become important when within the discussion section the linkage between the results and the literature are established.

4.2 Results for RQ1 (a) – Establishing students at risk of academic failure exist currently in school systems

This part of research question one sought to achieve the first main objective of the research, that being, to acknowledge the existence of 'at risk' students in Trinidad and Tobago classrooms. This was done through the following:

(i) presenting secondary data that illustrates historical data on three key elements- school dropout rates (primary and secondary school) and academic performance at key stages in primary and secondary school. This data was sought from three independent data sources in order for the information to be independently verified so an accurate determination can be made with respect to the existence of students at risk of academic failure and where in the education system they exist. As such secondary data from the Ministry of Education, the Office of the Prime Minister and the United Nations would be presented.

4.2.1 Quantitative data (secondary data) of school dropout from 2012 to 2019 – Dropout rates

Table 4.2 Ministry of Education (MOE) dropout statistics as a percentage of enrolment (Primary School)

Primary School Dropouts (as a Percentage of Enrolment)														
District	Academic Year													
	2012/2013		2013/2014		2014/2015		2015/2016		2016/2017		2017/2018		2018/2019	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Caroni	0.0-1	0.0-1	0.3-32	0.4-39	0.1-14	0.1-9	0.0-2	0.0-0	0.0-3	0.1-7	0.1-8	0.1-6	0.1-8	0.1-9
North Eastern	0.2-7	0.0-0	0.1-2	0.0-1	0.0-1	0.0-0	0.0-0	0.0-0	0.0-2	0.0-1	0.2-7	0.1-3	0.2-7	0.1-2
POS and Environs	0.1-11	0.1-8	0.1-14	0.0-3	0.1-8	0.1-5	0.0-4	0.0-0	0.0-1	0.0-4	0.0-3	0.0-0	0.1-7	0.0-3
South Eastern	0.2-7	0.1-5	0.1-5	0.1-4	0.1-6	0.1-5	0.3-15	0.3-14	0.0-0	0.0-1	0.0-0	0.0-1	0.1-5	0.1-5
St. George East	0.1-11	0.1-6	0.0-7	0.1-10	0.2-25	0.1-15	0.0-7	0.0-6	0.0-4	0.0-1	0.1-7	0.0-1	0.1-12	0.1-7
St. Patrick	0.3-19	0.1-7	0.1-9	0.1-9	0.2-15	0.1-5	0.0-0	0.0-0	0.0-2	0.0-1	0.1-6	0.0-2	0.1-7	0.0-1
Tobago	0.0-0	0.0-0	0.2-5	0.0-0	0.2-7	0.0-0	0.0-0	0.0-0	0.0-0	0.0-0	0.4-11	0.0-1	0.2-6	0.1-3
Victoria	0.0-2	0.0-0	0.1-8	0.0-3	0.0-4	0.0-0	0.0-0	0.0-0	0.0-2	0.0-2	0.0-1	0.0-0	0.2-16	0.1-10
Trinidad and Tobago	0.1-58	0.0-27	0.1-82	0.1-69	0.1-80	0.1-39	0.0-28	0.0-20	0.0-14	0.0-17	0.1-43	0.0-14	0.1-68	0.1-40

Source: Parliament of Trinidad and Tobago, 2020

Note: The MOE defined 'dropout' as a student who discontinued their education during the academic year Y and had been absent from the beginning of the school year y+1. A student who has transferred to another school is not classified as a dropout.

The above table documents secondary information provided from the Ministry of Education.

It shows primary school dropout rates across all education districts as a percentage of enrolment rates.

Table 4.3 Ministry of Education (MOE) dropout statistics as a percentage of enrolment (Primary School)

Secondary School Dropouts (as a Percentage of Enrolment)										
District	Academic Year									
	2014/2015		2015/2016		2016/2017		2017/2018		2018/2019	
	M	F	M	F	M	F	M	F	M	F
Caroni	2.3-171	1.4-89	2.9-214	1.5-104	2.9-200	3.4-215	1.2-98	4.2-263	0.8-60	0.4-23
North Eastern	3.1-116	2.1-74	2.6-98	1.7-63	1.6-60	0.7-24	0.8-32	0.6-22	2.1-98	1.6-66
POS and Environs	0.8-55	0.8-46	0.8-53	0.6-43	0.9-58	0.1-7	0.4-35	0.3-21	0.6-49	0.3-28
South Eastern	1.4-55	1.1-46	1.9-70	1.1-44	4.3-168	2.3-95	1.7-68	1.3-53	0.8-29	0.6-25
St. George East	2.4-120	0.9-64	1.4-68	0.9-59	0.1-6	0.1-6	0.2-10	0.0-0	1.9-106	0.9-69
St. Patrick	1.6-64	1.2-51	1.4-57	1.2-49	0.7-27	0.2-8	0.7-26	0.4-16	1.0-44	0.5-23
Tobago	1.2-17	0.0-0	1.8-26	1.3-19	2.0-29	0.8-11	0.0-0	0.2-4	1.5-30	0.4-8
Victoria	1.3-71	0.7-42	0.3-19	0.5-27	1.0-63	1.1-63	0.1-8	0.3-15	0.5-29	0.2-13
Trinidad and Tobago	1.8-669	1.1-412	1.6-605	1.0-408	1.6-611	1.1-429	0.7-277	1.0-394	1.1-445	0.6-255

The above table documents secondary information provided by the Ministry of Education. It shows secondary school dropout rates across all education districts as a percentage of enrolment rates.

Table 4.4 Office of the Prime Minister (OPM) dropout statistics

Academic Year(s)	Statistical description	Primary school dropouts	Secondary school dropouts
AY 2015/2016	Total number of drop outs in Government and Government assisted schools	49	1012
AY2016/2017	Total number of drop outs in Government and Government assisted schools	30	974

Source: Parliament of Trinidad and Tobago, 2020

The information provided in the Table 4.3 has been independently collected from data provided in Table 4.2 as it relates to statistics on drop rates across government and

government assisted schools for the period AY2015/2016 to AY2016/2017. The numbers show relatively low dropout rates in primary schools as compared to secondary school. Also reflected is a decrease of 3.9% over the two periods in the number of drop outs in secondary schools from AY2015/2016 to AY 2016/2017.

Table 4.5 United Nations (UN) drop out statistics

Academic Year(s)	Statistical description	Percentage
AY 2015/2016	Total number of drop outs in Government and Government assisted schools	802

Source: Parliament of Trinidad and Tobago, 2020

A third independent information source was sought to verify the internal data collect processes of both the Ministry of Education and the OPM. Again significantly different numbers were reported but still reflects a high frequency of dropout rates in government and government assisted schools though it does not differentiate between primary and secondary schools.

4.2.2 Quantitative data (secondary data) of school dropout from 2012 to 2019 – Repetition rates

Table 4.6 Secondary repetition rates for academic years 2013/2014 – 2018/2019

Secondary Repetition Rate for Academic Years 2013/2014 - 2018/2019										
Year	Form 1		Form 2		Form 3		Form 4		Form 5	
	M	F	M	F	M	F	M	F	M	F
2013/2014	0.63%	0.65%	0.17%	1.23%	0.09%	1.18%	0.28%	1.30%	5.13%	3.15%
2014/2015	0.15%	0.08%	0.13%	0.05%	0.05%	0.06%	0.34%	0.28%	4.27%	2.87%
2015/2016	1.08%	0.83%	0.95%	0.99%	0.88%	1.02%	1.12%	1.10%	4.69%	3.59%
2016/2017	0.15%	0.15%	0.06%	0.08%	0.07%	0.07%	0.24%	0.04%	0.77%	0.59%
2017/2018	0.00%	0.00%	0.01%	0.04%	0.00%	0.05%	0.03%	0.05%	0.53%	0.29%
2018/2019	0.08%	0.04%	0.13%	0.01%	0.10%	0.18%	0.26%	0.25%	2.02%	1.60%

Source: Parliament of Trinidad and Tobago, 2020

Table 4.6 aims to show the repetition rates from AY 2013/2014 to AY2018/2019. What is noticeable is that whilst the repetition rates at the lower level class are low, significant

increases are seen in the Form 5 classes in AY 2013/2014 to AY2016/2017 after which there is a dramatic drop for AY 2016/2017 and AY 2017/2018. In AY2018/2019 the increase in Form 5 begins to raise again. Similar data was not available for primary school repetition rates for analysis.

4.2.3 Quantitative data (secondary data) of school dropout from 2012 to 2019 – Academic performance (primary school)

Note: The National Test was originally designed to monitor student development to determine underperformance at the standards one (1) and three (3) primary levels within the subject areas of Mathematics and English Language Arts. The test was discontinued in 2016 in response to concerns about over-testing. More emphasis is being placed on formative assessment and re-designing the testing format to generate data on literacy and numeracy levels at the primary school level

Table 4.7 Students' Performance Standard One National Test English Language Arts

Subject	Year	Sex	No. of Students Below the Lowest Benchmark	% Below the Lowest Benchmark	No. of Students who Nearly Meets the Standard	% Nearly Meets the Standard	No. Students Writing
English Language Arts	2009	Female	866	10%	1799	21%	8622
		Male	1834	20%	2257	25%	9133
	2011	Female	1241	14%	3607	40%	8925
		Male	2463	26%	4003	43%	9344
	2012	Female	793	9%	2447	27%	9033
		Male	1896	21%	3121	34%	9211
	2013	Female	1094	12%	3039	34%	8930
		Male	2181	24%	3607	39%	9280
	2014	Female	1462	16%	2508	27%	9278
		Male	2580	27%	2863	30%	9428
	2015	Female	1409	16%	2476	27%	9012
		Male	2575	27%	2835	30%	9496
	2016	Female	1249	13%	3333	35%	9475
		Male	2183	23%	3499	37%	9425

Source: Parliament of Trinidad and Tobago, 2020

The above table show the academic performance in English Language Arts of primary school students in standard one as indicated through the student results that are below the required benchmark and results that nearly meet the required benchmark for the period 2009 to 2016.

The data was further analysed and the below chart extrapolated from the below numbers provided above.

Table 4.8 Percentage of students in standard one who fall below the required marks for Language Arts

Year	Total male and female numbers	No of students below the lowest benchmark	No of student who nearly meet the required standard	Total no of students who are below the requirement	Total number of students writing the exam	% of students at the standard one level below the required bench mark in Language Arts
2009	Total M/F	2700	4056	6756	17755	38.05
2011	Total M/F	3704	7610	11314	18269	61.93
2012	Total M/F	2689	5568	8257	18244	45.26
2013	Total M/F	3275	6646	9921	18210	54.48
2014	Total M/F	4042	5371	9413	18706	50.32
2015	Total M/F	3984	5311	9295	18508	50.22
2016	Total M/F	3432	6832	10264	18900	54.31
Average percentage of students at the standard one level below the required benchmark in Language Arts for the period 2009 - 2011						50.65

From the above extrapolation it could be seen that for the period 2009 to 2016 excluding 2010 a range of between 38.05% to 61.93% standard one students fall below the bench marks levels of attainment in Language Arts.

Table 4.9 Students' Performance Standard One National Test Mathematics

Subject	Year	Sex	No. of Students Below the Lowest Benchmark	% Below the Lowest Benchmark	No. of Students who Nearly Meets the Standard	% Nearly Meets the Standard	No. Students Writing
Mathematics	2009	Female	721	8%	1993	23%	8623
		Male	1309	14%	2365	26%	9125
	2011	Female	897	10%	2984	33%	8921
		Male	1558	17%	3389	36%	9348
	2012	Female	643	7%	1898	21%	9032
		Male	1246	14%	2195	24%	9205
	2013	Female	378	4%	2226	25%	8905
		Male	883	10%	2781	30%	9239
	2014	Female	858	9%	2464	27%	9245
		Male	1493	16%	2747	29%	9390
	2015	Female	962	11%	2713	30%	8949
		Male	1662	18%	3016	32%	9411
	2016	Female	1466	16%	2336	25%	9449
		Male	2099	22%	2349	25%	9393

Source: Parliament of Trinidad and Tobago, 2020

The above table show the academic performance in Mathematics of primary school students in standard one as indicated through the student results that are below the required benchmark and results that nearly meet the required benchmark for the period 2009 to 2016. The data was further analysed and the below chart extrapolated from the below numbers provided above.

Table 4.10 Percentage of students in standard one who fall below the required marks for Mathematics

Year	Total male and female numbers	No of students below the lowest benchmark	No of student who nearly meet the required standard	Total no of students who are below the requirement	Total number of students writing the exam	% of students at the standard one level below the required bench mark in Mathematics
2009	Total M/F	2030	4358	6388	17748	35.99
2011	Total M/F	2455	6373	8828	18269	48.32
2012	Total M/F	1889	4093	5982	18237	32.80
2013	Total M/F	1261	5007	6268	18144	34.55
2014	Total M/F	2351	5211	7562	18635	40.58
2015	Total M/F	2624	5729	8353	18360	45.50
2016	Total M/F	3565	4685	8250	18842	43.79
Average percentage of students at the standard one level below the required benchmark in Mathematics for the period 2009 - 2011						40.64

From the above extrapolation it could be seen that for the period 2009 to 2016 excluding 2010 a range of between 32.8% and 48.32% of standard one students fall below the benchmark levels of attainment in Mathematics.

Table 4.11 Students' Performance Standard Three National Test English Language Arts

Subject	Year	Sex	No. of Students Below the Lowest Benchmark	% Below the Lowest Benchmark	No. of Students who Nearly Meets the Standard	% Nearly Meets the Standard	No. Students Writing
English Language Arts	2009	Female	676	8%	2816	34%	8288
		Male	1779	21%	3460	40%	8665
	2011	Female	587	7%	3736	43%	8607
		Male	1515	17%	4322	48%	8918
	2012	Female	436	5%	1656	19%	8687
		Male	1290	14%	2384	27%	8935
	2013	Female	542	6%	3610	41%	8830
		Male	1392	15%	4259	46%	9194
	2014	Female	1219	14%	3220	36%	8915
		Male	2549	28%	3469	38%	9074
	2015	Female	691	8%	3383	38%	8912
		Male	1679	18%	3841	42%	9163
	2016	Female	748	8%	3437	38%	9127
		Male	1655	18%	3792	41%	9187

Source: Parliament of Trinidad and Tobago, 2020

The above table shows the academic performance in English Language Arts of primary school students in standard three as indicated through the student results that are below the required benchmark and results that nearly meet the required benchmark for the period 2009 to 2016. The data was further analysed and the below chart extrapolated from the below numbers provided above.

Table 4.12 Percentage of students in standard three who fall below the required marks in Language Arts

Year	Total male and female numbers	No of students below the lowest benchmark	No of student who nearly meet the required standard	Total no of students who are below the requirement	Total number of students writing the exam	% of students at the standard three level below the required bench mark in Language Arts
2009	Total M/F	2455	6276	8731	16953	51.50
2011	Total M/F	2102	8058	10160	17525	57.97
2012	Total M/F	1726	4040	5766	17622	32.72
2013	Total M/F	1934	7869	9803	18024	54.39
2014	Total M/F	3768	6689	10457	17989	58.13
2015	Total M/F	2370	7224	9594	18075	53.08
2016	Total M/F	2403	7229	9632	18314	52.59

From the above extrapolation it could be seen that for the period 2009 to 2016 excluding 2010 a range of between 32.72% and 58.13% of standard three students fall below the benchmark levels of attainment in Language Arts.

Table 4.13 Students' Performance in the Standard Three National Test Mathematics

Subject	Year	Sex	No. of Students Below the Lowest Benchmark	% Below the Lowest Benchmark	No. of Students who Nearly Meets the Standard	% Nearly Meets the Standard	No. Students Writing
Mathematics	2009	Female	1430	17%	3177	38%	8369
		Male	2078	24%	3128	36%	8775
	2011	Female	750	9%	3414	40%	8602
		Male	1332	15%	3637	41%	8918
	2012	Female	54	1%	2399	28%	8688
		Male	189	2%	3082	35%	8918
	2013	Female	711	8%	3277	37%	8828
		Male	1115	12%	3476	38%	9197
	2014	Female	878	10%	3012	34%	8908
		Male	1465	16%	3038	33%	9074
	2015	Female	1082	12%	3089	35%	8885
		Male	1693	19%	2985	33%	9112
	2016	Female	777	9%	2836	31%	9106
		Male	1296	14%	2882	31%	9161

Source: Parliament of Trinidad and Tobago, 2020

The above table shows the academic performance in Mathematics of primary school students in standard three as indicated through the student results that are below the required benchmark and results that nearly meet the required benchmark for the period 2009 to 2016. The data was further analysed and the below chart extrapolated from the below numbers provided above.

*Table 4.14 Percentage of students in standard three who fall below the required marks
Mathematics*

Year	Total male and female numbers	No of students below the lowest benchmark	No of student who nearly meet the required standard	Total no of students who are below the requirement	Total number of students writing the exam	% of students at the standard three level below the required bench mark in Mathematics
2009	Total M/F	3508	6305	9813	17144	57.24
2011	Total M/F	2082	7051	9133	17520	52.13
2012	Total M/F	243	5481	5724	17606	32.51
2013	Total M/F	1826	6753	8579	17425	49.23
2014	Total M/F	2343	6050	8393	17982	46.67
2015	Total M/F	2775	6074	8849	17997	49.17
2016	Total M/F	2073	5718	7791	18267	42.65

From the above extrapolation it could be seen that for the period 2009 to 2016 excluding 2010 a range of between 32.51% and 57.24% of standard three students fall below the benchmark levels of attainment in Language Arts.

4.2.4 Quantitative data (secondary data) of school dropout from 2012 to 2019 – Academic performance (secondary school)

Table 4.15 Percentage of Students (by Sex) that did not attain a passing grade in CSEC English and Mathematics

Exam Year	Percentage of Students failed English						Percentage of Students failed Mathematics					
	Female			Male			Female			Male		
	No. writing	No. failing	Percent	No. writing	No. failing	Percent	No. writing	No. failing	Percent	No. writing	No. failing	Percent
2019	7485	982	13%	6791	2000	29%	7457	3028	41%	6697	3260	49%
2018	7230	1156	16%	6762	2206	33%	7255	2530	35%	6785	2833	42%
2017	7430	1422	19%	6738	2103	31%	7347	2914	40%	6636	3124	47%
2016	6972	1224	18%	6537	2230	34%	6885	2623	38%	6370	2870	45%
2015	6900	1597	23%	6369	2639	41%	6833	2269	33%	6218	2555	41%
2014	6984	1783	26%	6501	2898	45%	6928	2747	40%	6405	2944	46%
2013	7102	1960	28%	6464	2903	45%	6983	3509	50%	6280	3623	58%
2012	7143	2522	35%	6418	3419	53%	7121	3633	51%	6278	3540	56%
2011	7537	1480	20%	7062	2661	38%	7559	3858	51%	6868	3989	58%
2010	8091	1771	22%	7235	2963	41%	7979	3826	48%	7036	3884	55%
2009	8414	2712	32%	7370	3654	50%	8276	3913	47%	7150	3818	53%
	Average Females Failing- 23%			Average Males Failing-40%			Average Females Failing – 43%			Average Males Failing- 50%		

Much like the data provided for primary school students, the above shows the academic performance of secondary school students over the time period of 2009 to 2019 in Language Arts and Mathematics. The data indicates that of the total number of female students who take the English assessment, 23% fail and the equivalent male failure rate stands at 40%. This was also collected across the total number of female student who take the Mathematics assessment where 43% fail with an equivalent male failure rate of 50%.

4.3 Results for RQ1 (b) – Ability to identify risk markers

The second part of research question one sought to answer the second part of the first objective, that being - Are teacher able to identify risk markers associated with students at risk of academic failure? To analysis the data collected the researcher looked at similar data that already existed in the literature where a summary of teacher reasons for classifying elementary students as being at risk was presented. This is shown in the below chart which was taken from Payne and Payne (1991) where the three highest ranked indicators were unsupportive home environments, attention problems and poor attitude towards school.

Table 4.16 Summary of Teacher reasons for classifying students as being at risk of academic failure.

TABLE 5
Summary (%) of Teacher (n=36) Reasons for Classifying Elementary Students as Being At-Risk*

Reason	Grade						Total
	K	One	Two	Three	Four	Five	
Unsupportive home environment (lack economic support, few parenting skills)	39	35	26	12	40	19	29
Attention problems (poor work habits, lazy)	19	12	24	55	14	24	22
Poor attitude toward school	9	26	29	15	18	42	25
Behavior problems (acting out)	12	8	12	9	5	8	—
Low self-esteem	3	3	5	—	5	5	3
Socio-emotional problems	6	6	5	—	5	5	5
General and developmental immaturity (including poor language development)	24	6	3	6	9	—	8
Miscellaneous	3	4	2	5	6	2	8

*Column totals exceed 100% as more than one reason may have been selected.

Source: Payne and Payne, 1991

Similar data was collected by the researcher and a comparative analysis was done. The data collected is shown below:

Table 4.17 Summary of Teacher reasons for classifying students as being at risk of academic failure – from researcher's data set

Reasons	%
Unsupportive home environment	18.37%
Attention problems	15.31%
Suspected disability that hinders learning	12.86%
Socio-emotional problems	12.45%
Poor academic history	11.43%
Behavioural problems	11.22%
Low self esteem	7.96%
General developmental immaturity	4.69%
Physical problems	1.84%
Attention problems	1.84%
Other	0.61%
Suspected disability that hinders learning	0.41%
Behavioural problems	0.41%
Poor academic history	0.41%
Low self esteem	0.20%

In the first instance the responses collected were converted from a mere count of responses to a percentage point where each response was counted as a unique response, which ensures a more holistic view of the data. In this data set if a similar range were to be looked at it could be seen that the top three reasons for classification as being a student who is at risk of academic failure are: Unsupportive home environment, attention problems and suspected disability that hinders learning.

4.4 Results from RQ2 - Teacher understanding of differentiated instruction for students at risk of academic failure

4.4.1 Overview

This research question addresses teacher understanding of differentiated instruction for students at risk of academic failure through three distinct variables – readiness, student interest and learner profile.

Two hypothesis statements were formulated:

H0: Teachers are not sufficiently knowledgeable in the understanding of differentiated instruction.

H1: Teachers are sufficiently knowledgeable in the understanding of differentiated instruction.

The null hypothesis was tested using a descriptive summary and an analysis of variance.

4.4.2 Comparison of means - Summary of results (Understanding)

A Likert scale was used to collect these responses where teachers were required to indicate their level agreement (strongly agree, agree, unsure, disagree, strongly disagree) to statements made around different aspect of understanding namely readiness, interest and learner profile. Numerical values were assigned to the each of the responses where the highest number of 5 was attached to strongly agree and a descending assignment of numerical values for the other options on the Likert Scale. The responses were tallied and the mean and standard deviation calculated. The mean being a measure of central tendency would essentially reflect a model of the data set and give a general idea of the level of agreement of the entire sample.

Acceptance of understanding (or rejection of the null hypothesis) was only given when the mean exceeded the threshold of 3. This is due to the fact that within the Likert scale 3 indicated teachers were unsure and neither in agreement or disagreement with the statements. Anything below three indicated that the respondent either disagreed or strongly disagreed with the statement thereby lacking the necessary understanding of differentiated instruction as it related to students at risk of academic failure. A summary of the questions can be seen in Appendix 2.

A summary of the teacher understanding is presented below.

Table 4.18 Summary of teacher understanding of differentiated instruction

Indicator	Question	Mean/Standard Deviation	Comment
Readiness	14	3.8 ±0.92	Reject H0
	15	4.32 ±0.63	Reject H0
	16	4.21 ±0.71	Reject H0
	17	4.03 ±0.99	Reject H0
	18	4.21 ±0.69	Reject H0
	19	4.12 ±0.67	Reject H0
	20	4.21 ±0.71	Reject H0
	21	4.34 ±0.66	Reject H0
	22	4.08 ±0.64	Reject H0
	23	4.22 ±0.79	Reject H0
	24	4.40 ±0.63	Reject H0
	25	4.16 ±0.68	Reject H0
Student Interest	26	4.11 ±0.72	Reject H0
	27	4.05 ±0.65	Reject H0
	28	4.10 ±0.68	Reject H0
	29	3.69 ±0.81	Reject H0
Learner profile	30	4.20 ±0.81	Reject H0
	31	4.23 ±0.64	Reject H0
	32	4.08 ±0.67	Reject H0
	33	4.01 ±0.68	Reject H0
	34	3.82 ±0.84	Reject H0
	35	3.89 ±0.73	Reject H0

4.4.3 Determining correlation as a prerequisite to an ANOVA

Correlation analysis was then carried out between the variables in the each of the broad indicators of understanding. This essentially was to ascertain if a teacher responded in a certain way to one of the statements under the subheadings of readiness, student interest and learner profile what would be the likelihood his or her response would be similar in the other statements presented under the same sub category. In all categories of understanding and implementation it was found that the statements were positively correlated. This acted as a pre cursor to an analysis of variance where any statement chosen would be an accurate reflection of all the responses in that category.

4.4.4 One-way ANOVA results

Following the correlation test one-way ANOVA was used to determine if there were any statistical differences between the means of three selected criteria from the data. The selected criteria being teacher experience, teacher type and teacher level. These were chosen as it was felt that these characteristics would impact the ability of teachers to understand differentiated instruction in students at risk of academic failure.

Understanding – Readiness

4.4.4.1 Analysis of variance (ANOVA) based on teacher experience on readiness

Table 4.19 Analysis of variance (ANOVA) based on teacher experience on DI on readiness

SUMMARY				
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Extensive	13	58	4.461538	0.435897
Some	89	376	4.224719	0.4262
None	4	12	3	1.333333

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	6.69757		3.34878	7.38022	0.00101	3.08457
	5	2	8	6	1	7
Within Groups	46.7363		0.45375			
	9	103	1			
Total	53.4339					
	6	105				

Based on the output from the analysis of variance it was noted that there is a significant difference between the sub groups based on experience. This is indicated through the p-value being less than 0.05. In order to ascertain the extent of these difference in each of the sub group a descriptive comparison was carried out.

If the summary table is looked at it would be noticed that the average across teachers with extensive and some experience is greater than three indicating that these teachers have good understanding of readiness. However, when we look at teacher with no experience with differentiated instruction it would also be observed that this number is less than 3 denoting that teachers with no experience of differentiated instruction have limited understanding of the concept.

4.4.4.2 Analysis of variance (ANOVA) based on teacher type on readiness

Table 4.20 Analysis of variance (ANOVA) based on teacher type on DI on readiness

SUMMARY				
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
General				0.46454
Education	98	414	4.22449	9
Special				1.14285
Education	8	32	4	7

ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>

	0.37273		0.37273	0.73056	0.3946644	3.93243783
Between Groups	8	1	8	6	6	1
	53.0612		0.51020			
Within Groups	2	104	4			
	53.4339					
Total	6	105				

Based on a one-way ANOVA it can be seen that teacher type does not impact the ability of teachers to detect readiness in students and this is demonstrated through a significance level (p - value) greater than 0.05. The perception of general education teachers and special education teachers on understanding of readiness concepts is the same.

4.4.4.3 Analysis of variance (ANOVA) based on teaching level on readiness

Table 4.21 Analysis of variance (ANOVA) based on teaching level on DI on readiness

SUMMARY				
Groups	Count	Sum	Average	Variance
Primary school	98	413	4.21428	0.41752
Secondary			6	6
School	8	33	4.125	1.83928
				6

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0.05896	2	0.05896	0.11488	0.73533	3.93243
		1	2	7	1	8
Within Groups	53.375	104	0.51322			
			1			
	53.4339					
Total	6	105				

Based on a one-way ANOVA it can be seen that teacher level does not impact the ability of teachers to detect readiness in students and this is demonstrated through a significance level (p - value) greater than 0.05. The perception of primary teachers and secondary teachers on understanding of readiness concepts do not differ from each other.

Understanding - Student Interest/Teacher experience

4.4.4.4 Analysis of Variance (ANOVA) based on teacher experience in DI on student interest

Table 4.22 Analysis of variance (ANOVA) based on teacher experience on DI on student interest

SUMMARY					
Groups	Count	Sum	Average	Variance	
Some	89	356	4	0.38636	4
Extensive	13	59	4.53846	0.26923	1
None	4	14	3.5	1	

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	4.53338	2	2.26669	5.80324	0.00409	3.0845
Within Groups	40.2307	103	0.39059			
Total	44.7641	105				

From the above summary of results, it can be seen that due to the fact that the p-value is less than 0.05 we can conclude that teacher experience has a significant impact on a teachers' understanding of student interest as it relates to students at risk of academic failure.

4.4.4.5 Analysis of variance (ANOVA) based on teacher type on student interest

Table 4.23 Analysis of variance (ANOVA) based on teacher type on DI on student interest

SUMMARY					
Groups	Count	Sum	Average	Variance	
General Education	98	398	4.06122	0.42920	3
Special Education	7	26	3.71428	0.23809	5

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	0.78639	5	0.78639	1.88101	0.173	3.9333
Within Groups	43.0612	2	0.41807	1	2	
Total	43.8476	2				

Based on a one-way ANOVA it can be seen that teacher type does not impact the ability of teachers to detect interest in students and this is demonstrated through a significance level (p -value) greater than 0.05. The perception of general education teachers and special education teachers on understanding of student interest concepts do not differ from each other.

4.4.4.6 Analysis of variance (ANOVA) based on teacher level on student interest

Table 4.23 Analysis of variance (ANOVA) based on teaching level on DI on student interest

SUMMARY					
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>	
Primary School	98	397	4.05102	0.44066	9
Secondary School	8	32	4	0.28571	4

ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	0.01925	3	0.01925	0.04474	0.83287	3.932
Within Groups	44.7449	104	0.43023	9	9	
Total	44.7641	5				

Based on a one-way ANOVA it can be seen that teacher level does not impact the ability of teachers to detect interest in students and this is demonstrated through a significance level (p -value) greater than 0.05. The perception of primary and secondary school teachers on

understanding of student interest concepts do not differ from each other.

Understanding – Learner Profile

4.4.4.7 Analysis of variance (ANOVA) based on teacher experience on DI on learner profile

Table 4.24 Analysis of variance (ANOVA) based on teacher experience on DI on learner profile

SUMMARY				
Groups	Count	Sum	Average	Variance
Extensive	13	56	4.30769	0.23076
Some	89	334	3.75280	0.75638
None	4	15	3.75	0.25

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	3.51331	1	1.75665	2.58180	0.08052	3.08457
Within Groups	70.0810	3	0.68039	5	6	7
Total	73.5943	4				

Based on a one-way ANOVA it can be seen that teacher experience does not impact the ability of teachers to detect interest in students and this is demonstrated through a significance level (p -value) greater than 0.05. The perception of across all experience levels on understanding of student interest concepts do not differ from each other.

4.4.4.8 Analysis of variance (ANOVA) based on teacher type on learner profile

Table 4.25 Analysis of variance (ANOVA) based on teacher type on DI on learner profile

SUMMARY				
Groups	Count	Sum	Average	Variance
General Education	98	377	3.84693	0.64643

				1.42857
Special Education	8	28	3.5	1

ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	0.89025		0.89025	1.27347	0.26171	3.93243
	8	1	8	5	2	8
Within Groups	72.7040		0.69907			
	8	104	8			
Total	73.5943					
	4	105				

Based on a one-way ANOVA it can be seen that teacher type does not impact the ability of teachers to detect interest in students and this is demonstrated through a significance level (p -value) greater than 0.05. The perception of general education teachers and special education teachers on understanding of student interest concepts do not differ from each other.

4.4.4.9 Analysis of variance (ANOVA) based on teaching level interest on learner profile

Table 4.26 Analysis of variance (ANOVA) based on teaching level on DI on learner profile

SUMMARY				
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Primary School	98	373	3.80612	0.71460
			2	1
Secondary School	8	32	4	0.57142
				9

ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	0.27801	3	0.27801	0.39436	0.53139	3.93243
Within Groups	73.3163	104	0.70496	5	1	8
Total	73.5943	105				

Based on a one-way ANOVA it can be seen that teacher level does not impact the ability of teachers to detect interest in students and this is demonstrated through a significance level (p -value) greater than 0.05. The perception of primary teachers and secondary teachers on understanding of student interest concepts do not differ from each other.

4.5 Results from RQ3 - Teacher implementation of differentiated instruction for students at risk of academic failure

4.5.1 Overview

This research question addresses teacher implementation of differentiated instruction for students at risk of academic failure through three distinct variables – learning environment, content and process/product.

Two hypothesis statements were formulated:

H0: Teachers are not sufficiently implementing differentiated instruction for students at risk of academic failure

H1: Teachers are sufficiently implementing differentiated instruction for students at risk of academic failure

The null hypothesis was tested using descriptive summaries and an analysis of variance.

A Likert scale was used to collect these responses where teachers were required to indicate their frequency of implementation (hardly ever/never do this, sometimes/have used it on a few occasions, frequently use this and use intentionally and often) to statements made around different aspect of implementation namely learning environment, content and process/product. Numerical values were assigned to the each of the responses where the highest number of 4 was attached to use intentionally and often and a descending assignment of numerical values for the other options on the Likert scale. The responses were tallied and the mean and standard deviation calculated. The mean being a measure of central tendency would essentially reflect a model of the data set and give a general idea of the frequency of implementation of the entire sample.

Acceptance of an adequate frequency of implementation was only given when the mean exceeded the threshold of 3. This is due to the fact that within the Likert scale 3 indicated teacher where unsure and neither in agreement or disagreement with the statements. Anything below three indicated that the respondent either disagreed or strongly disagreed with the statement thereby lacking the necessary understanding of differentiated instruction as it related to students at risk of academic failure. A summary of the questions can be seen in Appendix 2.

4.5.2 Comparison of means - Summary of results (Implementation)

Table 4.19 Summary of teacher implementation of differentiated instruction

	Question	Mean/Standard Deviation	Comment
Learner Environment	36	2.71 $\pm$ 0.83	Accept H0
	37	3.35 $\pm$ 0.79	RejectH0
	38	3.37 $\pm$ 0.84	RejectH0

	39	3.27 ±0.82	RejectH0
	40	3.26 ±0.78	RejectH0
	41	3.20 ±0.86	RejectH0
Content	42	3.34 ±0.75	RejectH0
	43	3.11 ±0.81	RejectH0
	44	3.30 ±0.79	RejectH0
	45	3.19 ±0.77	RejectH0
	46	3.14 ±0.72	RejectH0
	47	3.08 ±0.81	RejectH0
	48	2.92 ±0.81	Accept H0
	49	3.15 ±0.71	RejectH0
	50	3.20 ±0.71	RejectH0
	51	3.10 ±0.78	RejectH0
	52	2.94 ±0.80	Accept H0
	53	3.03 ±0.81	RejectH0
Process/Product	54	3.04 ±0.69	RejectH0
	55	2.57 ±0.87	Accept H0
	56	2.63 ±0.87	Accept H0
	57	2.67 ±0.89	Accept H0
	58	2.88 ±0.81	Accept H0
	59	2,44 ±0.84	Accept H0
	60	2.93 ±0.80	Accept H0
	61	2.95 ±0.86	Accept H0

Based on the summary above it can be concluded that teachers are sufficiently implementing the differentiated instruction strategies when it comes to learner environment. This is also (for the majority) the same for content. However, when it comes to process and product it can be concluded that all teachers fall short of its implementation for students at risk of academic failure, shown for the acceptance of the null hypothesis.

4.5.3 One-way ANOVA results

Implementation – Learning Environment

4.5.3.1 Analysis of variance (ANOVA) based on teacher experience on DI on learning environment

Table 4.22 Analysis of variance (ANOVA) based on teacher experience on DI on learning environment

SUMMARY				
Groups	Count	Sum	Average	Varianc e
Extensive	13	46	3.53846	0.76923
Some	89	300	3.37078	0.64504
None	4	11	2.75	2.25

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1.90612	2	0.95306	1.34945	0.26392	3.08457
Within Groups	72.7448	103	0.70626			
Total	74.6509	105				

Based on a one-way ANOVA it can be seen that teacher experience does not impact the ability to implement aspects of differentiated instruction learning environment and this is demonstrated through a significance level (p -value) greater than 0.05. The level of implementation across all experience levels on learner environment concepts do not significantly differ though it would be seen that teacher with no experience find it harder to implement as demonstrated by the difference in means.

4.5.3.2 Analysis of variance (ANOVA) based on teacher type on learning environment

Table 4.23 Analysis of variance (ANOVA) based on teacher type on learning environment

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Varianc e</i>
General Education	98	334	3.40816	0.61519
Special Education	8	23	2.875	1.83928

ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	2.10247	4	2.10247	3.01394	0.08551	3.93243
Within Groups	72.5484	7	0.69758	8	3	8
Total	74.6509	104	1			

Based on a one-way ANOVA it can be seen that teacher type does not impact the ability of implement aspects of differentiated instruction learning environment and this is demonstrated through a significance level (p -value) greater than 0.05. The level of implementation across all teacher types on learner environment concepts do not significantly differ though it would be seen that special education teachers implement on a less regular basis as compared to general education teachers.

4.5.3.3 Analysis of variance (ANOVA) based on teacher level on learning environment

Table 4.24 Analysis of variance (ANOVA) based on teacher level on learning experiences
SUMMARY

Groups	Count	Sum	Average	Varianc e
Primary	98	332	3.38775 5	0.67283 8
Secondary	8	25	3.125	1.26785 7

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0.51063 7	1	0.51063 7	0.71629 4	0.39930 5	3.93243 8
Within Groups	74.1403 1	104	0.71288 8			
Total	74.6509 4	105				

Based on a one-way ANOVA it can be seen that teacher level does not impact the ability of implement aspects of differentiated instruction learning environment and this is demonstrated through a significance level (p -value) greater than 0.05. The level of implementation across all teacher level on learner environment concepts do not significantly differ.

Implementation – Content

4.5.3.4 Analysis of variance (ANOVA) based on teacher experience on DI on content

Table 2.25 Analysis of variance (ANOVA) based on teacher experience on DI content SUMMARY

Groups	Count	Sum	Average	Varianc e
Extensive	13	41	3.153846	0.974359
Some	88	285	3.238636	0.482628
None	4	11	2.75	0.916667

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0.959532	2	0.479766	0.867186	0.423206	3.085465
Within Groups	56.43094	102	0.553244			
Total	57.3904	104				

Based on a one-way ANOVA it can be seen that teacher experience does not impact the ability of implement aspects of differentiated instruction as it relates to content and this is demonstrated through a significance level (p -value) greater than 0.05. The level of implementation across all experience levels on issues of content do not significantly differ though it could be seen that teacher with no experience find it harder differentiate content as compared to those with some and extensive experience.

4.5.3.5 Analysis of variance (ANOVA) based on teacher type on content

Table 2.26 Analysis of variance (ANOVA) based on teacher type on DI on content SUMMARY

Groups	Count	Sum	Average	Varianc e
General Education	98	316	3.22449	0.505786

				1.64285
Special Education	8	22	2.75	7

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1.66519	1	1.66519	2.85958	0.09382	3.93243
Within Groups	60.5612	104	0.58231	3	6	8
Total	62.2264	105				

Based on a one-way ANOVA it can be seen that teacher type does not impact the ability of implement aspects of differentiated instruction as it relates to content and this is demonstrated through a significance level (p -value) greater than 0.05. The level of implementation across all teacher types on issues of content do not significantly differ though it could be seen that special education teachers implement on a less regular basis as compared to general education teachers.

4.5.3.6 Analysis of variance (ANOVA) based on teacher level on content

Table 2.27 Analysis of variance (ANOVA) based on teacher level on content

SUMMARY				
Groups	Count	Sum	Average	Varianc e
Primary	98	313	3.19387	0.57027
Secondary	8	25	3.125	0.98214

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0.03508	1	0.03508	0.05867	0.80907	3.93243
Within Groups	62.1913	104	0.59799	7	6	8

	62.2264	
Total	2	105

Based on a one-way ANOVA it can be seen that teacher level does not impact the ability of implement aspects of differentiated instruction as it relates to content and this is demonstrated through a significance level (p -value) greater than 0.05. The level of implementation across all teacher levels on issues of content do not significantly differ.

Implementation – Process/Product

4.5.3.7 Analysis of variance (ANOVA) based on teacher experience on DI on process/product

Table 2.28 Analysis of variance (ANOVA) based on teacher experience on DI on process/product

SUMMARY				
Groups	Count	Sum	Average	Varianc e
Extensive	13	38	2.92307	1.07692
Some	88	226	2.56818	0.66196
None	4	7	1.75	0.91666

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	4.29791	2	2.14895	2.99183	0.05461	3.08546
Within Groups	73.2639	102	0.71827			
Total	77.5619	104				

Based on a one-way ANOVA it can be seen that teacher experience does not impact the ability to implement aspects of differentiated instruction as it relates to product/process and this is demonstrated through a significance level (p -value) greater than 0.05. The level of implementation across all experience levels on product/process concepts do not significantly

differ though it would be seen that teachers with no experience find it harder to implement this as demonstrated by the difference in means. *4.5.3.8 Analysis of variance (ANOVA) based on teacher type on process/product*

Table 2.29 Analysis of variance (ANOVA) based on teacher type on process/product

SUMMARY						
Groups	Count	Sum	Average	Varianc	e	
General education	98	252	2.571429	0.721649		
Special Education	8	20	2.5	1.428571		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0.037736	1	0.037736	0.049057	0.825147	3.932438
Within Groups	80.769231	104	0.769231			
Total	80.807467	105				

Based on a one-way ANOVA it can be seen that teacher type does not impact the ability of implement aspects of differentiated instruction as it relates to product/process and this is demonstrated through a significance level (p -value) greater than 0.05. The level of implementation across all teacher types on issues of content do not significantly differ.

4.5.3.9 Analysis of variance (ANOVA) based on teaching level on process/product

Table 2.30 Analysis of variance (ANOVA) based on teaching level on process/product

SUMMARY						
Groups	Count	Sum	Average	Varianc e		
Primary	98	253	2.58163	0.72007		
			3	2		
				1.41071		
Secondary	8	19	2.375	4		

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0.31579	1	0.31579	0.41196	0.52238	3.93243
	7		7	8	4	8
Within Groups	79.7219	104	0.76655			
	4		7			
	80.0377					
Total	4	105				

Based on a one-way ANOVA it can be seen that teacher level does not impact the ability of implement aspects of differentiated instruction process/product and this is demonstrated through a significance level (p -value) greater than 0.05. The level of implementation across all teacher level on process/product concepts do not significantly differ.

4.6 Results for RQ4 - Linking Differentiated Instruction for students at risk of academic failure to bottom up reform

4.6.1 Introduction

This part of the data collection process required that the researcher conduct interviews with teachers who are currently employed in the Trinidad and Tobago education system. Six teachers were interviewed each requiring them to provide comments on a single open ended question around the overarching theme of whether differentiated instruction for student at

risk of academic failure can form the basis of bottom up reform. The reporting on the responses of these question would be presented by question with the main themes extracted and some of the response quoted to corroborate its alignment with the theme.

4.6.2 Interview results: Do you believe the differentiated instruction you apply in the classroom when dealing with students at risk of academic failure could inform changes that leads to the eventual reform of the Trinidad and Tobago education system? Please explain why.

In response to these question teachers were encouraged to respond in whatever manner they believed appropriately answered the question. The below table summarises the results of the dominant themes emerging out of these interviews:

Table 2.31 Summary of themes from interviews

Interview Question 1	Themes emerging from teachers
Theme 1	The need for evidence based policy in Trinidad and Tobago is very important but the structure of the reporting systems does not allow for this.
Theme 2	Social and political forces play a major role in terms of what is implemented as policy despite what happens in the classroom.
Theme 3	Education policy implementation relates to translating specific education policy objectives into concrete education changes in the classroom (top down policy implementation).

Chapter 5: Discussion

5.1 Introduction

The purpose of this chapter is to situate the result of the study in the context of both the literature and the education culture of Trinidad and Tobago. As such the discussion will revolve around some measure of comparison between theory what has been put forward within the literature review and the findings of the primary and secondary data collected. This discussion and analysis will revolve around the researcher's ability to demonstrate the relationship between the primary research findings and the secondary research themes within the literature review to reveal plausible answers to the research questions.

The structure of this chapter will follow themes similar to those brought forward within the literature review; the existence of students at risk of academic failure, the indicators that predict students at risk of academic failure, understanding of differentiate instruction and how it translates to implementation and last the structure of bottom up policy and it ability to produce change.

5.2 Key findings and conclusions

5.2.1 The trajectory of students at risk of academic failure in Trinidad and Tobago and the dangers of looking at singular indicators.

The literature established that the existence of students at risk of academic failure is not unique to Trinidad and Tobago but an issue faced in all regions of the world. It is however noted that the instance of students at risk of academic failure is one where the rate of increase in the Caribbean and Latin American region is the third highest globally, only behind sub – Saharan Africa and South and Western Asia. What is noteworthy is the literature assess

the existence of students at risk of academic failure through the parameter of students who drop out of the school system. This is likely because the official definition of students at risk of academic failure as prescribed by National Centre for Educational Statistics (1988) as a student who is likely to fail at school. In this context, school failure is typically seen as dropping out of school before high school graduation. As a result, the measurement criteria only initiates once the student has dropped out of the school system. Through the examination of the secondary data provided in the results section we can see the existence or the preliminary signs that a student can be categorized as a student at risk of academic failure exists well before this stage is reached. Hence the inclusion of additional parameters is necessary when trying to establish the magnitude of the problem that exists around this category of student. It is thought that when dealing and establishing the existence of students at risk of academic failure additional parameters need to be included in the assessment. From the data provided not only are attrition rates recorded but also rates of repetition as well as academic performance. These indicators corroborate the idea that the existence of student at risk of academic failure manifest themselves in several ways in the education systems, however it is an indicator that is ignored. In the context of Trinidad and Tobago it is seen that at the primary school level despite having a relatively low rate of attrition, the at risk characteristics are manifested through other indicators. In terms of academic achievement on standardised tests at the primary school level it is reported in standard one in the core subject of Language an average of 50.65 percent of students fall below the required bench mark of required attainment, in Mathematics on average 40.64 percent of students fall in the same category. Isn't this a blatant sign of students who are at risk? In the instance that it is believed that these trends are just for that specific grade in primary school similar trends are also seen in standardised tests at the standard three level. This brings into question the relationships that

exist between academic achievement and students at risk of academic failure. A number of education research studies have established that poor academic performance is an important indicator as to the prediction of school failure (National Centre for Educational Statistics, 1988). In fact, it has been reported by Barrington and Hendricks (1989) that the existence of at risk students can be identified as early as third grade in student who fail to perform at the required level. This report also made the point that whereas students at risk of academic failure at the primary school level more or less have the same cognitive ability as their non at risk counterparts indicating they have the ability to achieve, student at risk generally show lower scores on achievement test and lower averages over a period of time. Again this has serious implications for this research as well as for future research in terms of defining and classifying who are student at risk of academic failure, who are likely to fall into this category and at what stage we can report on their existence. One can contend that this is resolved through the presentation of the UNESCO model of risk identification whereby each education district defines the parameters of risk. This however only becomes possible where there is awareness and the will at the policy and legislative levels to implement such a system of identification.

5.2.2 The added implications of the COVID -19 pandemic on students at risk of academic failure

According to UNESCO data dated April 2, 2020 (UNESCO, [2020](#)), approximately 1.5 billion students (about 85% globally) in 172 countries were affected by the closure of schools caused by the COVID -19 pandemic. The Secretary General of the United Nation has declared:

“We already faced a learning crisis before the pandemic,” said UN Secretary-General Antonio Guterres in a video statement to launch the Policy Brief. “Now we face a generational

catastrophe that could waste untold human potential, undermine decades of progress, and exacerbate entrenched inequalities.”

Whilst the number for students at risk of academic failure were not examined for the period AY 2020/2021 it is without a doubt that based on the already existing evidence the situation of these students would have worsened or brought to the forefront the endemic issues that they face. Since the analysis of this data it has been reported by the government of Trinidad and Tobago that in AY 2020-2021 2000 students disappeared from either the primary or secondary school system. It was reported that the profile of these students fell into the category of students who suffered as result of the economic fallout of the pandemic. Interestingly the issue of teacher absenteeism was raised as it relates to the impact it has on student dropout rates, academic performance and repetition rates. This is certainly an area that has not been examined by this research but judging from the data has a significant impact on students at risk of academic failure. In addition to this, what is also interesting is a statement made by the President of Parent Teachers Associate in Trinidad where it claims that this problem existed even before the onset of the pandemic, reiterating the possible problem that not all students at risk of academic failure are being captured in reporting systems. It could be said that only due to the dramatic rise in numbers is it getting the attention it duly deserves. The response from the Ministry of Education was one where it was stated that ‘More help and assistance from the State for these families can go a long way to help getting some of these students back in school. Some of them have left to help bring in money to care for their families so they are not online, while some others have no supervision to ensure they stay online as single parents go to work’. For the purpose of the discussion around this research the essence of the conversation is not around the fact there have be increased rates as the upward trend has been predicted. But rather , it is crucial to understand

the characteristic of these 2000 students so there is a better understanding of the predicative indicators that make students at risk of academic failure.

5.2.3 The understanding and implementation of differentiated instruction are two different things – Understanding need not necessarily lead to successful implementation

The treatment of students at risk of academic failure has also been well documented in the literature as being a group where there needs to be great understanding of their perceptions, experiences and motivations. The review of the literature indicated through the presentation of Figure 2.4 that teachers can differentiate instruction through content, the process of teaching and the manner in which they choose to assess (product), however in order to do this there must be solid understanding of student readiness, interests and their overall learning profile. This has been interpreted in this study as differentiated instruction having to have a dimension of understanding on the teacher's part and a dimension of implementation also on the teacher's part specifically when it comes to student at risk of academic failure where it was previous indicated that these students need to be treated as a distinct subset in a class room setting. Hence the process of data collection, sought to structure its statements around these parameters. When measuring understanding, teachers were asked to express their level of agreement in terms of students' background knowledge. In actuality this aimed to gauge if teachers understood in a classroom setting there are students who come from a diverse backgrounds as such affecting their background knowledge hence it being a criterion to understand when approaching differentiation. Other questions in the category included a similar line of questioning albeit in the areas of basic academic skills and its correlation to performance and teaching practice, attitude and motivation and the correlation to

performance and teaching practice and lastly study skills and the correlation to performance and teaching practice.

The data collected indicated according to the hypothesis tests where the null hypothesis was rejected that teachers do have good understanding of elements needed in differentiated instruction. This was corroborated by an analysis of variance where all indicators show teachers have a good understanding of differentiated instruction. There was an exception in understanding where ANOVA showed that teacher experience affects the level of understanding. Essentially this says that teachers with little experience have little understanding of the dynamics in a classroom that requires a classroom to be differentiated. From this study only 12.3% of teachers indicated having extensive knowledge of instructional differentiation with the major having some or no experience. In such a situation based on the literature students at risk of academic failure are not likely to succeed if their specific circumstance is not met with a teacher who understand the importance of a differentiated classroom.

When it comes to implementation that situation then becomes slight complicated as understanding affects implementation, as well as understanding need not necessarily lead to implementation. The literature highlights many impediments to the implementation of differentiated instruction for students at risk of academic failure. The most common being teachers have to put in extra work to plan and prepare classes that include students of different ability. Also highlighted is the issue of teachers being sufficiently trained to execute such a task as many schools do not have professional development programmes and resources to facilitate such training. Thirdly due lack of funding teachers are unable to create adequate learning environment to facilitate such instruction. In the Trinidad and Tobago

context what is especially peculiar is the total lack of implementation when it comes to the product aspect of differentiated instruction. The literature defines product as being the many ways in which teacher assess their students. Differentiated instruction recognises that if students learn through varied instruction then it stands to hold that students should also be assessed in a manner most suited to the student, as such they create varied tasks that help the student showcase mastery of concepts. When it comes to the context of Trinidad and Tobago, one has to reflect on the education culture where it was earlier highlighted in the report published by The Parliament of Trinidad and Tobago the challenges with the implementation of differentiated learning styles in these schools as automaticity and teaching to the test are engrained in the culture of teaching in Trinidad and Tobago and a major impediment to the realisation of teaching methodologies that would have an impact not only the performance of students but the performance of academic at risk students. This result certainly corroborates this.

5.2.4 Education policy in Trinidad and Tobago and the quest for social transformation

Hackett (2008) writes in his article Education and Policy that the methods through which policy is conceived in the Trinidad and Tobago still relies primarily on a centralised system. He however laments that in order to for policy to be deemed effective it needs to be driven by research and needs assessments. In essence and in accordance with the literature it is a top down process where most of the decisions are handed down from the technocrats for implementation at the lower level. We are reminded of the work of Mazmanian and Sabatier (1989) where it was said that three critical criteria need to be met for a top down approach to be successful. Those being 'tractability of the problem, ability of law to structure implementation, non-statutory variables affecting implementation' (Mazmanian and Sabatier, 1989 p.22). Based on the themes that have been highlighted when teachers were

asked if they believed differentiated instruction applied in the classroom when dealing with students at risk of academic failure could inform changes that leads to the eventual reform of the Trinidad and Tobago education system, many teachers brought up the issue of evidence based research and the fact that reporting systems fail to facilitate the upward movement of information. This brings into question two necessary points of discussion, one being the authorities who are in positions to formulate policy are not well informed as to the realities of what happens in the classroom thereby their inability to manage it. Secondly, this leads to the issue of not fulfilling one the most important of Mazmanian and Sabatier's criteria for the effectiveness of top-down approaches that being tractability of the problem – this is just not present. What can be inferred from the interviews and the responses that were received is teachers are keys players in the education system and hold much of the experiences necessary to provide input in the formulation of policy and in its current incarnation the systems are not designed to facilitate movement from the bottom up.

This is where the importance of bottom up policy becomes important as outlined by Sabatier (1986) where there the overall focus lies on the strategic interaction between all the actors in the policy network. Within the Trinidad and Tobago system at the current point in time there is a divide between the grass roots level and the centralised system described by Hackett. As expressed by teachers not only are there insufficient reporting systems but also many political and social forces which prohibit this sort of decentralization. The understanding of these forces is certainly an area that needs further investigation and likely the basis of subsequent studies.

Chapter 6: Conclusion & Recommendations

This study has highlighted the issue of students at risk of academic failure and the role that differentiated instruction could play in recognising diverse abilities and circumstances of students. Trinidad and Tobago is a country that is still entrenched in the workings and ideologies of a colonial system that still segregates students who are not deemed as being 'bright'. It is a system that rewards those who do well academically and displaces those who do not meet the required standard irrespective of the origins or nature of that circumstance.

The main objectives identified for this piece of research were as follows:

- (i) To acknowledge the existence of 'at risk' students in Trinidad and Tobago classrooms and teachers' ability to identify this category of student.
- (ii) To identify the level of understanding and implementation of instructional differentiation available to 'at risk' students.
- (iii) To explore if instructional differentiation for at risk students can lead to or be purposely linked to bottom up school reform.

The findings of the research certainly solidified through many different indicators that students at risk of academic failure certainly exist but the key conclusions when it came to this objective is that student at risk of academic failure exist on a multi-dimensional basis meaning there are various perspectives with which we need to define this category of student and no one perspective must be seen as more important than the other. Another important finding coming out from this objective is that fact that students at risk of academic failure can be detected from as early as grade 3 and the statistics that are available through the Ministry of Education's monitoring systems detect this through the academic performance on

standardised tests at the primary school level. However, when it comes to policy formation around this there is little action.

When it came to the second objective this again was answered when it was recognised that the major problem did not lie in the understanding of differentiated instruction even in the instance of student at risk of academic failure but rather who is monitoring implementation to ensure these students are identified in the first instance and then supported in the classroom.

Thirdly, when it came to exploring the possibility of a bottom up approach it is seen that a fundamental restructuring of the reporting systems and the rethinking of what works in the Trinidad and Tobago system needs to be looked before any t purposeful and well networked policy can be formulated.

6.1 Limitations and Implications for future research

One of the key issues encountered when doing this research study was the ability to effectively collect data from teachers in Trinidad and Tobago. This was compounded by the COVID-19 pandemic where most teachers were conducting classes from home and the ability to gain their collective opinions and perceptions was difficult. As a direct result of this we had to rely on a database of teacher where there was not control over what type of teacher answered the questionnaire. As such it would be seen the number of responses collected from secondary school teachers is significant disproportionate to those collected from primary school teachers. The researcher was also not physically located in Trinidad and Tobago at any point in time in this study also limiting the ability to collect data.

One of the key areas highlighted for future research as pointed out in the discussion section is the identification of the main social and political issues that impede the switch from top down to bottom up policy creation. Trinidad and Tobago is a very complex society often with social and political influences, power structures and historical norms superseding what is contextually necessary in favour of what suits the social climate at the time. This has serious implications when it comes to policy formation and implementation and a domino effect of the further sustainability goals. If the necessary structures are not put into place in the present then future improvements cannot be expected. Early on the presentation of this study it was mentioned that many teachers were unwilling to teach children who were not readily and immediately amenable to traditional instruction. It would be interesting to know where the genesis of this attitude lay since through this study it indicated that teachers understood the reasons why and circumstances under which differentiated instruction was needed. This again is likely another line of research that logically follows from this one in terms of the attitudes and perceptions around the implementation of differentiated instruction in Trinidad and Tobago classrooms.

6.2 Recommendations

Whilst it seems that the issue of training may not be the primary issue in terms of understanding and implementing differentiated instruction for students as risk of academic failure as all indicators show strong understanding and understanding how to implement. Therefore providing a recommendation along the lines of implementing training programmes would not solve the issue. This of course is with the exception of training around product aspects of implementation (even so this has its limitations). As a result, the primary recommendation coming out of this research is the implementation of change management strategies that takes teachers away from the mind set of teaching for the majority of the class

to teaching for each child in class which goes hand in hand with leaving no child behind not even students at risk of academic failure. Changing the mindset of teachers away from teaching students to pass an exam and believing that students who do not fall with a specific spectrum of ability are not worth the effort is key to improving the circumstance of students at risk of academic failure.

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Appendix 1

Link to document :

https://docs.google.com/document/d/1wQT8mVAQ5j2M53DxJtHyctFie8dgDXeh7ljhN8Z0_JU/edit?usp=sharing

Appendix 2

Section I: Background Demographic Data

Please complete the following questions:

1. Current subject area taught: (checkbox option)

☐ Reading ☐ Writing ☐ Mathematics ☐ Social-Studies ☐ Science ☐ Other

If other, please specify _____

2. What type of teacher are you?

☐ General Education Teacher ☐ Special Education Teacher

3. Current grade taught

☐ K ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th ☐ 5th ☐ 6th

4. Gender

☐ Male ☐ Female

5. Your age range is:

☐ 21-25 years ☐ 26-30 years ☐ 31-35 years ☐ 36-40 years ☐ 41-45 years

☐ 46-50 years ☐ 51-55 years ☐ 56-60 years ☐ 60+ years

6. Education Level (check all that apply)

☐ Bachelor's Degree ☐ Master's Degree

☐ Master's Degree plus 30 ☐ CAGS

☐ Doctoral Degree ☐ Other Please specify _____

7. How many years have you been teaching?

☐ 1-3 years ☐ 4-10 years ☐ 11-15 years ☐ 16-20 years

☐ 21-25 years ☐ 26-30 years ☐ 30+ years

8. I would describe my differentiated instruction experience as:

☐ None ☐ Some ☐ Extensive

9. If you have been trained, what type of training have you had (click all that apply)?

☐ Course from college or University

☐ Teleconference/Online

☐ Learned on my own through readings

☐ Mentored by a colleague

☐ In-service activity

☐ Conferences, meetings, or workshops

☐ Other: Please specify _____ 4

10. Please expand on the training you had

Section 2: Establishing teacher awareness of students at risk of academic failure (teacher effectiveness) Payne and Payne/ Rumberger

1. How many students do you currently teach?

2. Of those students how many would you classify as being at risk of academic failure

3. From the list below tick your reasons for identifying a student as at risk of academic failure:

☐ Unsupportive home environment (lack of economic support, few parenting skills)

☐ Attention problems (poor work habits, lazy)

☐ Poor attitude toward school

☐ Behaviour problems

☐ Low self esteem

☐ Socio – emotional problems

☐ General developmental immaturity (including poor language development)

☐ Physical problems

☐ Poor academic history (low test scores)

☐ Other (please specify)

Section 3: Level of understanding of student readiness, interest and learner profile as it relates to differentiated instruction Tomlinson (2005) model

(1) Strongly agree (2) Agree

(3) Unsure (4) Disagree (5) Strongly disagree

Readiness

1. Students in my class/es differ significantly in relevant background knowledge

2. There is a strong correlation between students' background knowledge and their performance.

3. My understanding of variance in individual students' background knowledge impacts what/how I teach.

4. Students in my class/es differ significantly in basic academic skills (e.g. reading, comprehension, written expression, problem solving).

5. There is a strong correlation between students' academic skills and their performance.

6. My understanding of variance in individual students' academic skills impacts what/how I teach.

7. Students in my class/es differ significantly in their study skills (e.g. note taking, examination, time management).

8. There is a strong correlation between students' study skills and their performance.

9. My understanding of variance in individual students' study skills impacts what/how I teach.

5

10. Students in my class/es differ significantly in their attitude/motivation towards academic performance
11. There is a strong correlation between students' attitude/motivation and their academic performance.
12. My understanding of variance in individual students' attitude/motivation impacts what/how I teach.

Student Interest

1. I know individual student interest and can relate it to instruction.
2. I know individual student culture and expectations and can relate to instruction.
3. I know individual student life situations and how it may impact their learning.
4. I am aware of student's learning disabilities and handicaps and how to address them in lessons so as not to impair their learning.

Learner profile

1. I know students in my class/es differ significantly in their learning modalities (e.g visual, auditory, active or passive, intelligence preferences).
2. There is a strong correlation between learning modalities and student performance.
3. My understanding of variances in individual candidates learning modalities impacts what/how I teach.
4. I know students in my class/es differ significantly in their preferred grouping orientations (e.g. whole class, small group, individual)
5. There is a strong correlation between candidates 'grouping orientation and their performance.
6. My understanding of the variance in individual students' group orientations impacts what/how I teach.

Level of implementation that supports differentiated instruction

- (1) Hardly ever/Never do this (2) Sometimes/Have used on a few occasions
(3) Frequently use this (4) Use intentionally and often

Learning Environment

1. Create activities/assignments to develop a sense of community among students.
2. Take deliberate efforts to ensure each student feels known, welcome and respected.
3. Take deliberate efforts to make yourself approachable/available to students.
4. Take deliberate efforts to ensure students participate consistently and equitably during class.
5. Take deliberate efforts to enhance candidates' attitude/motivation towards class content.
6. Follow up privately on behaviours or circumstances of concern (e.g absences, low grades, conflict, low motivation etc).

Content

1. I clearly articulate what I want students to know, understand and be able to do.
2. I use text materials that present content at varying levels of complexity.
3. I use materials that represent a variety of formats (e.g. text, audio, web based)
4. Use text and or other materials that present content in a variety of ways (narrative& graphic, theory to example, example to theory)
5. Use text and/or materials that reflect the students' interests and experiences
6. Provide supplemental materials/resources to support candidates who have difficulty understanding the class content.
7. Provide supplemental support to students who have difficulty understanding the class content (e.g. additional extra classes).
8. Use strategies to support comprehension and retention of content presented in text materials (e.g. guided reading questions)
9. Use strategies to support comprehension and retention of content presented in class (e.g. end of class summaries etc.)
10. I adjust for diverse learner needs with scaffolding.
11. I adjust for diverse learner needs with tiered instruction.
12. Solicit candidate feedback to help select/adjust content

Process/Product

1. I vary my pace of instruction varies based on individual learner needs.
2. I use learner preference groups and/or learning preference centers
3. I group students for learning activities based on readiness, interests, and/or learning preferences.
4. preferences.
5. The classroom environment is structured to support a variety of activities including
6. group and/or individual work.
7. I provide multiple modes of expression in the final product.
8. I provide students with the choice to work alone, in pairs or small group.
9. The product connects with student interest.
10. I provide variety of assessment tasks.

Assessment

1. I pre-assess students before instructing.
2. I pre-assess readiness to adjust the lesson.
3. I assess during the unit to gauge understanding.
4. I assess at the end of the lesson to determine knowledge acquisition.
5. I determine student's learning styles.

Appendix 3

OVERVIEW OF THE RESEARCH & CONSENT

The British University in Dubai
Faculty of Education

(Insert Date)

Dear Participant,

You are being invited to participate in a research study on teachers' perspectives on students at risk of academic failure and its linkage to educational reform in Trinidad and Tobago. In particular, we are interested in finding out how differentiation at both the content and process level as it pertains to students at risk of academic failure can contribute to reform of the national curriculum.

This research will require about 15 minutes of your time if you are completing the questionnaire and 30 minutes of your time if you are participating in the interviews. During this time, you will be asked to share your experiences covering your approach and interactions with students at risk of academic failure. Both the questionnaire and interview will be conducted digitally and once you submit your responses will automatically be recorded by the sender.

There are no anticipated risks or discomforts related to this research. You may also find this questionnaire to be very enjoyable and rewarding, as many people who deal with students at risk of academic failure rarely get the opportunity to share their experiences.

By participating in this research, you may also benefit others by helping people to better understand the impact of dealing with the issue of students at risk of academic failure has on the overall school system. Several steps will be taken to protect your anonymity and identity. While the interviews will be recorded, the recordings will be destroyed once the information has been documented. The questionnaires will NOT contain any mention of your name, and any identifying information from the interview will be removed. Your participation in this research is completely voluntary.

The results from this study will be presented as a thesis document read by academics at The British University in Dubai and other academics/educators at educational institutions in and out of Trinidad and Tobago. At no time, however, will your name be used or any identifying information revealed. If you wish to receive a copy of the results from this study, you may contact one of the researchers at the contact information given below.

If you require any information about this study, or would like to speak to one of the researchers, please contact Danielle Wilson-Gulston at danielle.wilson@buid.ac.ae at The British University in Dubai, United Arab Emirates. If you have any other questions regarding your rights as a participant in this research, you may also contact Dr Tendai Charles at tendai.charles@buid.ac.ae at The British University in Dubai, United Arab Emirates who is supervising this research.

I..... voluntarily agree to participate in this research study.

☐ I understand that even if I agree to participate now, I can withdraw at any time or refuse to answer any question without any consequences of any kind.

☐ I understand that I can withdraw permission to use data from my interview within two weeks after the interview, in which case the material will be deleted.

☐ I have had the purpose and nature of the study explained to me in writing and I have had the opportunity to ask questions about the study.

- ☐ I understand that I will not benefit directly from participating in this research.
- ☐ I agree to my interview being audio-recorded.
- ☐ I understand that all information I provide for this study will be treated confidentially.
- ☐ I understand that in any report on the results of this research my identity will remain anonymous.
- ☐ I understand that disguised extracts from my interview may be quoted in the dissertation, conference presentation, published papers etc.
- ☐ I understand that I am free to contact any of the people involved in the research to seek further clarification and information.

Signature of research participant

Signature of participant Date

Signature of researcher

I believe the participant is giving informed consent to participate in this study