THE UNIVERSITY OF THE WEST INDIES
THE UNIVERSITY OFFICE OF PLANNING AND DEVELOPMENT

Higher Education and Statistical Review 2016: Productivity and Performance at the University of the West Indies: An Exploratory Study

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ABOUT THE UNIVERSITY OFFICE OF PLANNING AND DEVELOPMENT/UNIVERSITY PROJECT MANAGEMENT OFFICE

The University Office of Planning and Development (UOPD) falls under the Vice-Chancellery or the Regional Headquarters of The University of the West Indies (UWI) and is one of many administrative units which assist the Vice Chancellor in administering the affairs of the University. It is headed by a Pro Vice Chancellor (PVC), Planning and Development who reports directly to the Vice Chancellor.

The UOPD has four (4) components, namely: strategic planning, institutional research, development and project management. It has overall primary responsibility for coordinating the preparation, implementation, monitoring and assessment of the University's Strategic Plan. It also coordinates efficiency studies and prepares productivity reports to inform operational and strategic planning efforts. In relation to its institutional research function, the UOPD:

- Develops, maintains and disseminates strategic information on current undergraduate and postgraduate students, graduates, peer institutions and employers;
- Provides timely and accurate information for planning, internal decision-making and external accountability; and
- Supports the strategic development, analysis and evaluation of policies and plans for the University.

As part of the University's development agenda, the Office functions in designing, monitoring and evaluating the University's major development plans and programmes - whether academic, infrastructural or financial.

The PVC, Planning and Development works closely with the Vice Chancellor and other members of the Executive Management Team (EMT) in monitoring the Strategic Plan, and related project development with multi-sectoral, regional and international agencies and also seeks to preserve a positive relationship with these agencies.

The resourcing of the University's vision is crucial to its realisation. In relation to this, the Office of the PVC, Planning and Development plays a major role in identifying funding needs for regional University programmes. It also drives UWI's partnership-building thrust with key international donor agencies, universities and the diaspora communities. The UOPD is an integral part of the Vice Chancellery located on the St. Augustine Campus, Trinidad and Tobago, and linked to other offices at the Mona Campus, Jamaica, and the Cave Hill Campus, Barbados.

At the start of the academic year, 2012/2013, the University Project Management Office (UPMO) rejoined the UOPD. The UPMO is mandated with the responsibility of researching, preparing, developing and managing projects for the portfolios of the Vice-Chancellery in accordance with the strategic priorities. The UPMO provides project management support in the areas relative to institutional development, academic programme development and infrastructural development. It also provides technical support in project management related to institutional development, academic programme development and infrastructural development and secures external grants that are in alignment with the University's strategic aims.

The UPMO is engaged to establish and administer mechanisms and associated procedures as follows:

- Develop proposals for funding;
- Review and produce as applicable, modified version(s) of project proposals developed by other units;
- Perform project monitoring and evaluation activities that can lead to accountability and project/programme improvement; and
- Facilitate skills development workshops.

For more information on the UOPD see: http://uwi.edu/uopdx and UPMO see http://uwi.edu/upmo.

ACKNOWLEDGEMENTS

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To all, we are appreciative of the time and efforts in making this publication a reality.

LIST OF ACRONYMS

ACTT	Accreditation Council of Trinidad and Tobago
AMBA	Association of MBAs (Master of Business Administration)
BI	Business Intelligence
BSC	Balanced Scorecard
BUS	Board of Undergraduate Studies
CDB	Caribbean Development Bank
CFI	Composite Financial Index
COPIR	Campus Office of Planning and Institutional Research (St Augustine)
EED	Employee Engagement and Development
EMBA	Executive Master of Business Administration
EMT	Executive Management Team
ERP	Enterprise Resource Planning
EUA	European University Association
FT	Full Time
FTE	Full Time Equivalent
FYR	First Year Retention
GATE	Government Assistance for Tuition Expenses (Trinidad and Tobago)
GCI	Global Competitiveness Index
GDP	Gross Domestic Product
GII	Global Innovation Index
HEI/HEIs	Higher Education Institutions
HESR	Higher Education and Statistical Review
ICT	Information and Communication Technologies
IMF	International Monetary Fund
IOP	Internal Operational Procedures
KPIs	Key Performance Indicators
MBA	Master of Business Administration
MBBS	Bachelor of Medicine and Bachelor of Surgery
MOUs	Memorandum/Memoranda of Understanding
MSBM	Mona School of Business and Management
OBUS	Office of the Board of Undergraduate Studies
OGS&R	Office of Graduate Studies and Research
PG-SES	Postgraduate Student Experience Survey
PT	Part Time
PVC	Pro-Vice Chancellor
PWDs	Persons With Disabilities
QAU	Quality Assurance Unit
RBC	Royal Bank of Canada
SSR	Student Staff Ratios
SYM	(Student Experience Survey) Speak Your Mind
THE	Times Higher Education
TQM	Total Quality Management
UCSIS	University Consortium of Small Island States
UMR	U-Multirank
UOPD	University Office of Planning and Development
UPG	University-Private Sector-Government
UPMO	University Projects Management Office
URAP	University Ranking by Academic Performance
UWI	University of the West Indies
WEO	World Economic Forum

EXECUTIVE SUMMARY

This second edition of the *Higher Education and Statistical Review* (HESR) will examine the notions of productivity and related performance in higher education with particular reference to The University of the West Indies (UWI). The purpose of this *HESR* is to provide insights on efficiency and effectiveness of the UWI in key areas of operation (financial, administrative, teaching/learning and research) aimed at influencing practice and policy-making at the University and provide useful information for the monitoring of the *UWI Strategic Plan, 2012-2017.* It is hoped that the *Report* will imbue the UWI with a sense of urgency to develop a data governance structure and the production of more robust datasets. Institutional data and data from two ranking agencies are used for the empirical analysis within this *Report*.

In Chapter One, working definitions of key terms are provided. The following terms are defined in the chapter.

- **Productivity i**s a ratio of the volume of goods and services (outputs) produced relative to the volume of inputs – including land, labour and capital employed in producing those goods and services.
- **Efficiency** is achieved when an institution optimise or maximise its use of fixed resources to achieve their goals and objectives.
- **Effectiveness** is the extent to which the institution's educational outputs and outcomes have achieved the agreed strategic goals and objectives and are satisfying the needs and desires of its key stakeholders.
- **Quality** is understood to be a judgement about the level of goal achievement and the value and worth of that achievement.
- **Performance** is the degree to which a strategic intervention operates according to specific criteria/standards/guidelines or achieves results in accordance with stated goals or plans.

There are several reasons why maximising or enhancing productivity and performance can be potentially beneficial to the University. These include: an increase in the quantum of outputs without additional cost; maintenance/enhancement of quality without the need for additional resources; improvement in stakeholder satisfaction and expectations; a more globally competitive University; and improvement in the productivity of the economies of the region.

The following assumption was made in preparing this document: *The UWI will continue to operate for some time in an exceedingly competitive higher education sector with reduced funding, structural deficits, rapidly changing technologies, increasing student demands, increased accountability measures from governments and higher expectations from stakeholders forcing the University to critically re-evaluate its mission and operations to satisfy the needs to their stakeholders (governments, funding agencies, private sector, students, etc).* The Report was faced with limitations related to data availability and gaps and benchmarking.

Although the first University *Report* of its type it is by no means comprehensive and presents a snapshot of the existing institutional and ranking data to showcase valid productivity and performance measures for financial, administrative, teaching/learning, and research sectors.

Chapter Two: Review of Related Literature on Productivity and Performance

This chapter summarises the concepts adopted in the research such as definitions of productivity and performance with particular reference to higher education and the sectoral areas – financial, administrative, teaching and learning, and research. The associated measures for the sectoral areas as identified in the literature are also discussed.

Chapter Three: Financial Productivity and Performance Measures

Over the past few years serious cash flow problems have been experienced by all four campuses; the result of the continued economic crisis prevailing in the UWI contributing countries. A dual approach towards ensuring its financial viability and sustainability has been adopted involving an aggressive effort at garnering revenue from non-traditional sources complemented by stringent cost containment measures. The focus of the chapter is twofold: one,

the overall financial health of the institution is analysed using a spectrum of broad financial ratios and two, selected areas of progress are measured in relation to the stated objectives of the Financial Perspective of the *Strategic Plan, 2012-2017*.

One of the critical success factors in achieving the goals and objectives of the *Strategic Plan* and by extension, the Mission of the University is its financial health. The consultancy company (Attain LLC) hired by the University indicated that measurement of the financial health of the UWI would be driven by the answers to four key questions:

i. Does UWI have sufficient expendable resources that are flexible enough to meet its mission? (Primary Reserve Ratio);
ii. Does UWI manage debt consistent with its mission? (Viability Ratio);
iii. Has UWI obtained sufficient return on all of its equity to support its mission? (Return on net assets ratio); and
iv. Has UWI lived within its means? (Net operating revenues).

The answers to these questions are blended to create an overall numerical measurement of financial health which is best viewed over a period of time and can be applied historically and prospectively. The score for financial health indicates the University's ability to withstand downturns in economic positions, make investments in strategic initiatives, and meet existing financial commitments. The results show instability in that the UWI is currently below the threshold level and thus, in a precarious position.

This chapter also examines the strategic themes from the viewpoint of efficiency and effectiveness. The main strategic themes examined are Income Source Diversification and Efficient Resource Utilisation. The key findings are as follows for Income Source Diversification:

- **Reducing dependence on government funding:** Over a ten-year period (2004/2005 to 2014/2015) there has been some measured success for the UWI based on the fact that the percentage of government contribution has been reduced from 51.7 per cent in 2004/2005 to 46.1 per cent in 2014/2015. At the campus level, the ratio varied, showing the Mona Campus to be the most successful and least dependent by moving from 51.3 per cent in 2004/2005 to 32.4 per cent 2014/2015.
- **Diversifying and expanding the revenue base:** Some progress has been made in terms of diversification as evidenced by the fact that percentage income for Special and Other Projects increased from 20 per cent in 2004/2005 to 29 per cent in 2014/2015, while the share for commercialisation increased from 5 per cent to 9 per cent for the same period. The share of income from tuition fees appeared to have declined from 17 per cent to 13 per cent and this must be cause for some concern. On a campus basis, there were significant variations. In terms of non-government income, Cave Hill Campus was at 41.6 per cent compared to 67.6 per cent at Mona Campus. Income from tuition fees was highest for the Open Campus at 40.4 per cent compared to 7.7 per cent for the St Augustine Campus, while income from commercial operations was 23.5 per cent for Mona Campus compared to 2 per cent for Cave Hill Campus.
- **Externally Funded Grants per FT Academic Staff:** A critical area in expanding and strengthening the funding base is externally generated funds for special projects. External funding includes research and other project funding. Externally generated funds per full-time (FT) academic staff has shown an overall increase over the observed period despite the fact that there was a significant decline in 2014/2015 from the previous year, moving from US$118,311 per FT Academic staff in 2013/2014 to US$44,167 in 2014/2015.

The key findings are as follows for Efficient Resource Utilisation:

- **Overall cost per FTE student:** The per capita cost per FTE student for the UWI fluctuated over the ten-year period, but overall, still showed an increase, moving from US$8,177 per student to US$9,430 in 2014/2015. At the campus level, Cave Hill campus spent more per student than any other campus, moving from US$9,030 to US$11,544 in 2014/2015 with the increases in the last two years mainly due to declining enrolment. The Mona and Open Campuses were able to reduce spending per student over the period with the Open Campus showing the lowest per capita cost when compared to the other campuses.

Chapter Four: Measuring Productivity in the UWI Administrative Services

The *UWI Strategic Plan 2012-2017* has two Perspectives that addresses strategic alignment to administrative services, namely, (1) Employee Engagement and Development (EED) and (2) Internal Operational Processes (IOP). Their corresponding themes, goals and objectives are viewed as the integrated strategic framework to measure the performance of administrative services to both staff and students. This strategic framework addresses the human resources, enterprise systems, operational processes and policies that impact on operational effectiveness and performance improvement of the University.

The EED Perspective involves the active participation of both academic and non-academic employees in the delivery of efficient educational services and addresses three main themes, namely: (i) Competency-based Development, (ii) Culture of Employee Engagement, and (ii) Strengthening Performance Management Systems. The IOP Perspective can be defined as the critical organisational activities and processes that impact on the quality of service that the UWI provides to its various stakeholders and consist of three main themes, namely: (i) Efficient and Effective Academic and Administrative Processes, (ii) Governance Arrangements and (iii) Management Structures.

Data were derived from the 2012 and 2015 UWI Employee Engagement Surveys, the 2010 and 2013 Undergraduate Student Satisfaction and Experience Surveys and the 2013 Postgraduate Student Experience survey. EED and IOP completion of initiatives information was also derived from the 2015 Operational Plans reports submitted by the Campus and units of the Vice Chancellery.

The results of this performance analysis into administrative services revealed that there is less than good employee engagement and process demands in the UWI. The performance scores in the two BSC Perspectives of Employee Engagement and Development and Internal Operational Processes also suggest areas of weakness or developing weakness in overall performances. Also, information derived from the undergraduate and postgraduate student surveys revealed a moderate level of satisfaction with University administrative services.

However, the UWI through the completion of initiatives in the Campus and Vice Chancellery Operational biennial Plans, has made incremental improvements over the past four years with the completion of key student and staff administrative services. With respect to the Perspective of Employee Engagement and Development, 38 per cent of the 77 initiatives were at some degree of completion and with the Internal Operational Processes Perspective, 19 per cent of the 73 initiatives were at some degree of completion.

A university-wide policy framework for productivity and continuous improvement is urgently required and must be developed to ensure greater efficiencies in the administrative and operational management of the UWI. Overall, there is need to introduce a university-wide Data Governance and Management Structure which is seen as critical to the development of new policies and procedures and the introduction of systems and processes for the production and the use of university performance data. This has implications for evidenced based decision-making, provision of data to global ranking agencies, and monitoring of the *Strategic Plan*.

Chapter Five: Teaching and Learning Productivity and Performance Measures

Teaching, Learning and Student Development is the core business of the UWI and will always be a priority item. The *Teaching, Learning and Student Development* Perspective focuses on enhancing academic quality to support the development of the seven key attributes of the UWI graduate. This Perspective also involves improving the total student experience, and open and distance education service.

The findings in the area of Enhance Academic Quality are:

- **Student satisfaction scores in academic quality and academic related services:** Generally, students were satisfied with teaching quality and course quality and moderately satisfied with IT and library services. However, they were not satisfied with academic advising, timely feedback from lecturers and availability of lecturers for consulting.

- **Student satisfaction scores in non-academic services:** In terms of non-academic services, and physical and social services, students were generally moderately satisfied. A particular area of concern is Career and Placement Office Services which is a key area in terms of the overall student experience. Students were also not satisfied with on-campus transportation.
- **Expand Distance Learning Opportunities – Open Campus enrolment as % of Total UWI Enrolment:** Expanding distance learning opportunities is measured by taking Open Campus enrolment as a percentage of total UWI enrolment. The Open Campus enrolment as a percentage of total enrolment has been fairly stagnant and has even declined within recent times, falling from 13.3 per cent in 2013/2014 to 12.0 per cent in 2014/2015. It should also be noted that there are also a number of distance/online programmes offered at the Mona Campus with 416 students enrolled in 2014/15 compared to 459 in the previous year.

In relation to Graduate Prospects – enhance the employability of graduates, the following conclusions were made:

- **Employment Rates of UWI Graduates:** A look at overall employment rates for the UWI graduates between 2009 and 2013 reveals that while the majority of graduates find employment at least one year after graduation, there are still large numbers of unemployed graduates. Time series data suggest that there is a trend of decreasing employment rates moving from an overall rate of 87 per cent in 2009 to 78 per cent in 2013.
- **Underemployment rate:** Graduates with a degree in Medicine, Education or Engineering were more likely to be employed as professionals and managers. Graduates employed in secondary level jobs were more prominent in Social Sciences, Humanities and Education, while graduates employed in intermediate jobs were more prominent in Sciences, Agriculture and Social Sciences.
- **Employability of graduates – development of key attributes:** Low ratings were given to 'Innovative and Entrepreneurial Skills' and 'Information Technology Skills' suggesting these were problematic areas. Greater focus, therefore, needs to be placed in strengthening these skills since creating wealth and developing innovation for a knowledge based economy requires a skilled labour force with these key attributes.

Efficiency in the Teaching Function - Analysis of Throughput showed the following:

- **Undergraduate Retention and Attrition Rates:** The First Year Retention (FYR) rates for each faculty as at the end of the cohort's first academic year of study. Overall, the first year retention rates stood at 86 per cent in 2006 with Engineering having the highest rate of 94 per cent and Science and Agriculture having the lowest rate of 79 per cent. This is consistent with an earlier study of the 1995 and 1998 cohort (Greaves and Dass 2000) where first year retention for the campus was approximately 89 per cent indicating a marginal difference.
    - The attrition rate of this cohort was calculated at 9 per cent. However, at the faculty level, there was an evident higher attrition rates among students enrolled in the faculties of Social Sciences and Science and Agriculture where the attrition rates were 15 per cent and 12 per cent, respectively.
- **Graduation rates:** Overall graduation rates by faculty for the St Augustine Campus. Overall, 69.5 per cent of students entering in the 2006 cohort graduated. When comparing these rates across faculties, it was noted that Medical Sciences had both the highest graduation rate of 81.5 per cent, while Science and Agriculture had the lowest achieving 64.4 per cent completion rate.
- **On Time Graduation Rate and On–time completion*:*** The issue of on-time completion suggests that at the St Augustine Campus, for the 2006 cohort, just under one–half of the graduates completed their programme on-time at the undergraduate level. At the Faculty level, Medical Sciences (MBBS) had the highest on time graduation rate of 81 per cent, while Science and Agriculture had the lowest rate with 39 per cent.
- **Student-Staff Ratios:** SSR for UWI as a whole increased gradually from 17.9 in 2005/2006 to 19.6 in 2014/2015. On a campus basis, the SSR varied with Cave Hill Campus showing a low of 16.8 to a high of 21.9 for Mona Campus in 2014/2015.

Chapter Six: Quality in Teaching and Learning

The chapter examined the concept of quality from perspective of quality of University inputs (teaching factors) and the University's output of graduates. The chapter considered the perception of the quality of teaching from the student and employer perspective and referenced the alumni/graduate, the quality of the graduates and teaching staff. The concept of quality is seen as integral to both productivity and performance which the University views as being applicable to the management of all of its human, physical, technological, information and financial resources, internal operations and communications. The current *Strategic Plan* speaks to excellence in its Mission Statement and quality in relation to three of its six strategic Perspectives.

The four campuses of the University hold institutional accreditation from National Accreditation Agencies and programmes in fields such as Engineering, Medicine and Business have programme accreditation.

Informed by the current *Strategic Plan* several strategic objectives-to-strategic initiatives are either completed or underway that seeks to enhance academic quality. A University Task Force on Quality, chaired by the PVC, BUS (Board of Undergraduate Studies) established in April 2015, which grew out of a proposal drafted by the QAU for an integrated quality management system at the University, recommended *inter alia* the development of an overarching UWI Quality Policy that would articulate a UWI-wide integrated quality management system and establish a Quality Management Team.

Data was analysed from the student experience and employer surveys. In considering the issue of quality from the perspective of teaching and learning, focus was given to the perspective of the quality of teaching from the student and employer. The stakeholders saw this element as strong. The UWI has developed a set of attributes that a graduate should acquire during their tenure at the University and which is critical to a work-ready graduate. The undergraduates gave this dimension a strong rating as did the postgraduates. Across the region, employers expressed varying levels of satisfaction with the general qualities and skills of the graduates. However, there was some concern expressed with the soft skills of the graduates. One indication of the quality of graduates produced by universities is the proportion of "Good Honours" degrees earned by the institution's graduates. For the period under consideration (2009/2010 to 2013/2014) approximately a third of all graduates earned Good Honours.

Chapter Seven: Research Productivity and Performance Measures

Data from the Global Competitiveness Index (GCI) was considered in light of efficiency driven economy depending on higher education and training, while an innovation based economy is based on research and development as well as flows of knowledge. These areas – higher education and training and research – forms the core areas of the UWI's business. Data extracted from the GCI focussing on the pillars related to higher education and training and innovation for Barbados, Jamaica and Trinidad and Tobago show that these countries are performing at an average level on the higher education and training pillar and below average on the innovation pillar. Data was also considered from the Global Innovation Index (GII) which captures the multi-dimensional facets of innovation and provides the tools that can assist in tailoring policies to promote long-term output growth, improved productivity, and job growth. The Index generally ranks the Caribbean in the low to middle range with relatively low rates of innovation efficiency.

The research productivity of the UWI as measured by the number of refereed research publications has remained relatively stable at about 1800 published articles from 2011 to 2014, resulting in an average of one publication per full-time academic staff per year. While the number of research publications is similar to that of benchmark peer institutions, the research output of the UWI needs to be targeted for improvement. Results from the U-Multirank ranking agency shows that the UWI performs below average on each of the "Research" and "Knowledge Transfer" indicators included in this report.

Other research related indicators provide further support to the University's need to improve its research productivity; the ratio of doctoral graduates to FTE academic staff is extremely low and the level of satisfaction reported by doctoral students about their research experience provided by the UWI also requires attention and remediation by University executives. Additionally, an examination of the University's expenditure shows that less

than 10 per cent of University spending is devoted to funding research activities while more than half of the University's budget is spent on teaching activities.

Recommendations to improve the research productivity of the UWI include:

- Increased publication in regional and international journals.
- Routine comprehensive reporting of the research output of academic staff.
- Implementation of a University-wide academic workload study.
- Implementation of the recommendations outlined in the *Innovation at the University of the West Indies* report.

Chapter Eight: Conclusion and Recommendations

This chapter provides a summary of the findings of previous chapters by identifying areas of productivity improvements and also sets out recommendations for practice and policy. Among the key recommendations is a call for **enhance performance reporting/business intelligence** by implementing a university-wide *Data Governance and Management Structure.* This will support the *development of an institutional data dictionary.* The importance of a systematic institutional benchmarking was highlighted.

Several surveys/studies are seen as critical to the improving productivity and enhancing performance of the University. These include: regular University/Campus Research Output studies, Faculty Workload Studies, and throughput and retention studies.

In the area of **financial productivity and performance** reference is made to the strategies are already outlined in the *UWI Strategic Plan 2012-2017.* More specifically, the following recommendations were made: *continue to reduce reliance on government funding particularly for* those campuses that are still above 50 per cent, *diversify and expand the revenue base, improve external funding for projects per FT academic staff*, and *reduce cost per FTE student.*

A university-wide policy framework for productivity and continuous improvement is urgently required and must be developed to ensure greater efficiencies in the **administrative and operational management** of the University. The UWI administrative services goals and strategies, delineated in the existing *Strategic Plan*, should be wholly adopted, with the main objective to transform and modernise the total quality management of university operations, which will improve the quality of services to all of its stakeholders. The importance of administrative and economic metrics is highlighted.

For the core business of the University, **Teaching, Learning and Student Development,** the University needs to enhance the teaching and course quality for students and identify the causal factors responsible for the less than stellar results. Also, there is need for improvement in the area of non-academic services so as to provide students with positive experience of University life. Again, reference is made to the strategies are already outlined in the *UWI Strategic Plan 2012-2017.* Other areas for improvement include: relevance and marketability of programmes and ensure a work-ready graduate, and improving throughput rates.

This concept of **quality** is integral to teaching/learning and research noting the symbiotic relationship between these core functions. Various strategies are outlined in *UWI Strategic Plan 2012-2017* and the recommendation relating to a Quality Policy outlined in the Task Force Report on Quality, which may guide the development of the *UWI Strategic Plan 2017-2022.*

For **Research and Innovation,** the University should be tracking its research output, increase the number of peer-reviewed publications in regional and international journals, enhance the research culture among academic staff, assess the research productivity of academic staff, expand entrepreneurship and innovation, increase research productivity of post-graduate students and increase funding and partnerships. Again, several of these strategies are outlined in the *UWI Strategic Plan 2012-2017.*

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CHAPTER ONE: INTRODUCTION

This second edition of the *Higher Education and Statistical Review* (HESR) will examine the notions of productivity and performance in higher education with particular reference to The University of the West Indies (UWI). In the 2013 edition of the *HESR* (131), it was noted that "the UWI must become more efficient while significantly improving its productivity in all areas. In other words, the UWI must grapple with the issue of 'cost disease' which refers to a university's inability to implement efficiency measures as well as increase or maintain productivity in the context of increasing cost."

The 2015 edition of the *HESR* provides insights on productivity and performance of the UWI in key areas (financial, administrative, teaching/learning and research) and provides useful information for the monitoring of the *UWI Strategic Plan, 2012-2017.* It is expected that this publication will inform not only practice and policy-making at the University, but also imbue the UWI with a sense of urgency to develop a data governance structure and the production of more robust datasets. Institutional data and data from two ranking agencies are used for the empirical analysis within this *Report*.

This chapter presents the rationale and objectives for the study, definition of key terms, the research methodology, institutional overview and an outline of the structure of the study.

1.1. Rationale for study

Ashraf and Javed (2012, 4) noted that there is "tremendous pressure on universities in providing high-quality education and operating result." Citing Tang and Zairi (1998), Ashraf and Javed (2012, 4) indicated that this is a result of "a decline in the traditional pool of higher education students; growing dissatisfaction and frustration with spiralling college costs; undergraduate teaching practices; and government fiscal restraint" in the United States. These drivers led to higher educational institutions (HEIs) to introduce "efficient and disciplined use of resources; achievement of value for money; increased productivity through the use of systematic planning, organization and control; and measurement of achievement against declared objectives by comparisons across institutions" (Chen et al 2009, 221; Ashraf and Javed 2012, 4). These measures facilitated the adoption of a total quality management (TQM) system to improve competitiveness (Ashraf and Javed 2012, 4).

Caribbean economies are currently undergoing difficult economic challenges. The IMF WEO (Jan 2016, 3) cautions that aggregate GDP in Latin America and the Caribbean is projected to contract in 2016, albeit at a smaller rate than in 2015. This reflects the recession in Brazil and other countries in economic distress. The World Bank forecasts that for the Caribbean[1] there will a 3.1 per cent, 2.9 per cent and 3.1 per cent expansion in the economy for 2016, 2017 and 2018, respectively (World Bank 2016, 110). A RBC Economic Report citing the Caribbean Development Bank (CDB) Report also warns that the weighted average growth rate is expected to fall from one per cent in 2015 to 0.3 per cent in 2016, skewed by a 2.5 per cent contraction expected for Trinidad and Tobago in 2016. Excluding Trinidad and Tobago, regional weighted average growth is projected to intensify from 1.4 per cent in 2015, to 1.7 per cent in 2016 (RBC March 2016, 1).

In the past, the UWI was supported in the main by the public purse however, limits are being placed on public funding, leading to greater pressure on the University to fend for itself financially. At the same time,

[1] The Caribbean here refers to Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Dominican Republic, Haiti, Jamaica, St. Lucia, St. Vincent and the Grenadines, and Trinidad and Tobago.

the UWI is expected to produce high quality graduates and cutting edge research, keep up with rapid technological advancement, increased internationalisation, and improve accountability to stakeholders (government, development partners, private sector, students, etc), while responding to competition in the sector and higher expectations from stakeholders. Borrowing from the private sector, two strategies are touted as possible solutions for this 'new normal' in the public and not-for-profit education sector - one, is to reduce reliance on governments by raising more revenue and the other, is to improve productivity. The general consensus is that they are both complementary and should be done simultaneously. As such, the UWI is not immune to the drivers that propels focus on efficiency and effectiveness of its operations. This will make it imperative that the UWI understands its current performance and productivity improvements over time and regularly publish reports on the same. This will not only facilitate increase transparency and improve accountability, but will also strengthen the use of benchmarking as a tool for driving efficiency (Universities UK 2011, 5).

1.2. Objectives of the study

The purpose of this *HESR* is to provide insights on efficiency and effectiveness of the UWI in key areas (financial, administrative, teaching/learning and research) aimed at influencing practice and policy-making at the University as well as provide useful information for the monitoring of the *UWI Strategic Plan, 2012-2017.*

The objectives of this study is to analyse productivity and performance within the UWI's operations. More specifically, the study will:

- summarise how the concepts of productivity and performance are applied to higher education;
- provide empirical evidence on productivity and performance in the UWI and identify the scope for productivity and performance measurements applicable to the UWI; and
- make recommendations for improving productivity and performance practice and policy-making within the UWI.

1.3. Definition of key terms

A basic definition of **productivity** is a measure of output per unit of input (Gates and Stone 1997.1, OCUFA 2006, 3). Sullivan (2012, 61) stated "productivity should be defined as the ratio of quality-adjusted outputs to quality-adjusted inputs." It is a critical measure for improvement in outputs over time. Higher productivity means accomplishing more with the same amount of resources, or the same with fewer resources. The concept of productivity embodies two parts: **efficiency** (cost) and **effectiveness** (quality).

The concept of **quality** is seen as integral to productivity and performance which the University views as being applicable to the management of all of its human, physical, technological, informational and financial resources, internal operations and communications. In seeking to define quality, the UWI draws upon the structural development of quality posited by Harvey and Stensaker (2007, 7) to include: (i) fitness of purpose; (ii) fitness for purpose; (iii) value for money; (iv) transformative development of students and staff; and (v) adherence to high standards, including internal and external customer service standards.[2] In other words, quality is the degree to which an object (entity) [e.g., process, product, or service] satisfies a specified set of attributes or requirements (Eqavet Glossary Website).

[2] See Lee Harvey and Bjørn Stensaker. "Quality culture: understandings, boundaries and linkages." Paper presented at the EAIR Forum Innsbruck, September 2007. http://www.qualityresearchinternational.com/Harvey%20papers/Harvey%20and%20Stensaker.pdf.

Adapting the definition of **performance** from the World Bank (2004, 227), performance is seen as the degree to which a strategic intervention operates according to specific criteria/standards/guidelines or achieves results in accordance with stated goals or plans. The concept is related to cost, flexibility, speed, dependability or quality (Tangen (2005, 40) and can be applied to the project, programme, or policy that is being implemented against expected results.

Box 1.1: Definition of Concepts

Productivity is a ratio of the volume of goods and services (outputs) produced relative to the volume of inputs – including land, labour and capital employed in producing those goods and services.

Efficiency is achieved when an institution optimise or maximise its use of fixed resources to achieve their goals and objectives.

Effectiveness is the extent to which the institution's educational outputs and outcomes have achieved the agreed strategic goals and objectives and are satisfying the needs and desires of its key stakeholders.

Quality is understood to be a judgement about the level of goal achievement and the value and worth of that achievement.

Performance is the degree to which a strategic intervention operates according to specific criteria/standards/guidelines or achieves results in accordance with stated goals or plans.

1.4. Applying the concepts of productivity and performance to the UWI

The section identifies the UWI perspective on productivity and performance, the approach used, the sources of data, and the limitations of the study. A short profile of the University is provided for context.

1.4.1. About The University of the West Indies

The UWI comprises four campuses, namely, Cave Hill in Barbados, Mona in Jamaica, St. Augustine in Trinidad and the Open Campus.[3] All four campuses deliver high quality education, research and associate services to all seventeen (17) contributing countries that support the University *(see Box 1.2)* (HESR 2013,8). The UWI is funded in part by the governments of seventeen (17) countries (Campus and Open Campus countries), tuition fees, investment of assets, fundraising of various kinds and philanthropic giving (HESR 2013, 5,6).

BOX 1.2: CAMPUS CONTRIBUTING COUNTRIES

•Anguilla • Antigua & Barbuda • The Bahamas • Barbados • Belize • Bermuda • British Virgin Islands • Cayman Islands • Dominica • Grenada • Jamaica • Montserrat • St. Kitts & Nevis • St. Lucia • St. Vincent & the Grenadines • Trinidad & Tobago • Turks and Caicos Islands

[3] The Open Campus was established in 2008 to broaden access and improve the quality of tertiary education in countries and regions traditionally underserved by UWI and in genuine need of increased tertiary access. The Open Campus is an amalgamation of the previous Office of the Board for Non-Campus countries, the School of Continuing Studies (SCS), the UWI Distance Education Centre (UWIDEC) and the Tertiary Level Institutions Unit (TLIU). The Open Campus offers pre-University, professional development, undergraduate and graduate courses and programmes in online, face-to-face and blended format. It is a virtual campus with 42 physical site locations across the Caribbean region serving over seventeen (17) countries in the English-speaking Caribbean (HESR 2013, 9).

Each individual campus has an organisational structure comprising campus administration, academic teaching Faculties and research entities.[4] The central administrative arm of the UWI (or the Regional Headquarters) facilitates the coordination and cohesion of its campus parts. It consists of both administrative offices and teaching and research centres located on any one or more of the three UWI campuses. The Regional Headquarters also has responsibility for university-wide projects such as employee engagement, fundraising and the *Strategic Plan, 2012-2017.*

The UWI remains committed to the economic, social, cultural and political development of the region through **Teaching, Research, Innovation, Advisory and Community Services** and **Intellectual Leadership**. It remains, irrefutably, the only genuinely regional higher educational institution in the Caribbean in concept, scope, reach, diversity and impact.

1.4.2. Research approach

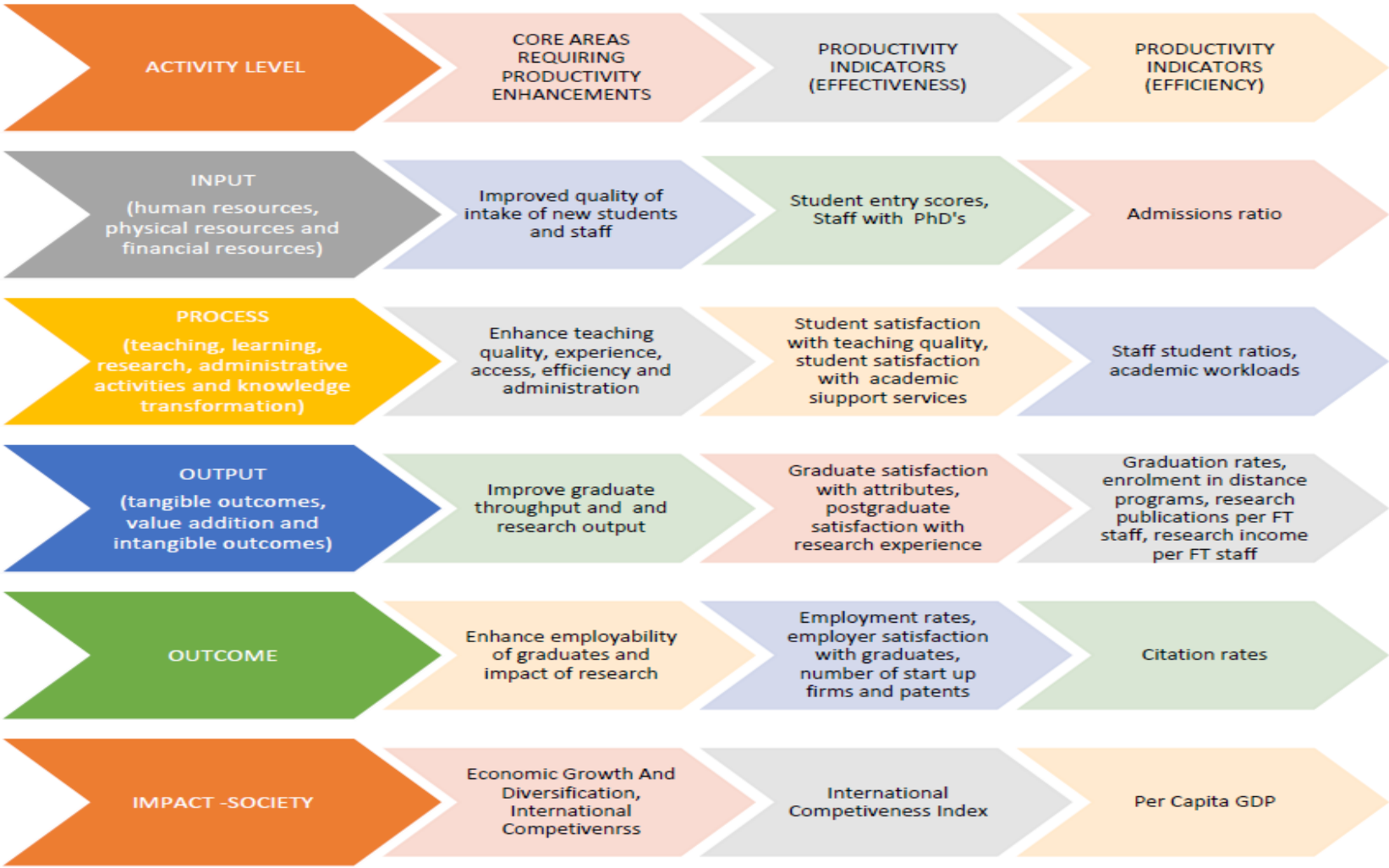
In conceptualising the concepts of productivity and performance, the authors were guided by a body of work produced by economists and management scholars (e.g. OCUFA 2013; Sullivan 2012; Council of Ontario Universities 2006; Tangen 2004; Gates and Stone 1997; and Zamarippa 1994), which is explored in Chapter 2.

The UWI understands productivity as the ratio of the volume of goods and services (outputs) produced relative to inputs employed in producing these goods and services. Hence, the concepts of efficiency and effectiveness are applied. The core functions of higher education are considered namely, teaching and research and the support structures, financial and administration. In this way, productivity and performance are also considered in relation to the Perspectives and Themes in the *Strategic Plan, 2012-2017.* Figure 1.1 shows a diagrammatic map of input-output productivity model for the Univeristy, which serves to guide the understanding of productivity and performance issues at the University. The approach adopted identified measures of both effectiveness and efficiency and then applied them to measure and monitor productivity and performance in the UWI.

Performance is understood as the degree to which a strategic intervention operates according to specific criteria/standards/guidelines or achieves results in accordance with stated goals or plans that draws attention to excellence and/or transformation.

[4] With reference to campus administration, this comprises the Office of the Principal, Registry, Bursary, Estate Management/Maintenance, Information Technology Services, Libraries and Teaching Faculties/Departments. The Faculties of Humanities and Education, Law, Medical Sciences, Science and Technology and Social Sciences are common to Cave Hill, Mona, and St. Augustine. The St. Augustine Campus has retained its differentiation by maintaining the Faculties of Engineering and Food Production and Agriculture. The Institutes of Business are affiliated institutions at St Augustine (Arthur Lok Jack Graduate School of Business), Cave Hill Campus (Cave Hill School of Business) and the Mona Campus (Mona Graduate School of Business and Management) and are considered to be a part of the Campus' Faculty of Social Sciences. It should be further noted that there are other Institutes that operate as departments of specific Faculties. For example, the Caribbean Institute of Media and Communication (CARIMAC) is a department of the Mona Campus' Faculty of Humanities and Education. Similarly, the Centre for Hotel and Tourism Management, which is physically located in The Bahamas, is a part of the Mona Campus' Faculty of Social Sciences (HESR 2013, 5,6).

Figure 1.1: Diagram Of Input-Output Productivity Model For the UWI



Note: Ashraf and Javed (2012, 10) in discussing TQM in higher education proposed aspects for consideration under the input- process-output chain. See Sadaf Ashraf and M. Kamran Javed. "An Academic Scorecard for Performance Measurement of Higher Education Institutes." Paper presented at the 2012 Cambridge Business & Economics Conference, UK. June 2012. http://www.gcbe.us/2012_CBEC/data/Sadaf%20Ashraf,%20M.%20Kamran%20Javed.docx.

The study will provide actual computation of data from circa 2009/2010 to 2013/2014 (or the most recently available). Based upon available data, either a five-year time series will be used or intervals or one-data point. In cases where data are available for a longer period of time, data are analysed for ten years (2004/2005 to 2013/2014). Table 1.1 identifies the productivity and performance measures will be explored in this publication.

TABLE 1.1: PRODUCTIVITY AND PERFORMANCE MEASURES USED

Theme	**Measures of productivity and performance**	
	Efficiency	***Effectiveness***
Finance	• Per capita cost per FTE • Primary Reserve Ratio • Viability Ratio • Return on Net Assets Ratio • Net Operating Revenues • Composite Financial Index	• Primary Reserve Ratio • Viability Ratio • Return on Net Assets Ratio • Net Operating Revenues • Composite Financial Index • UGC funding as percentage of total income • % Distribution of income by source • External funded projects per FT staff • Income from commercial operations (amount and % growth)
Administrative *Employee Engagement and Development*	• Composite score of employees responding to questions on technology, process, business value, leadership skills, customer focus, immediate supervisor, innovation, communication and visionary leadership	• Nature of Work Score • Growth Opportunities Score • Personal Development Score • Performance Management Score • Visionary leadership Score • Line of Sight Score • Trust and Integrity Score • Process Score
Internal Operational Processes	• Composite score of undergraduate/ postgraduate students satisfaction with University Academic Support services • Composite score of undergraduate/ postgraduate students satisfaction with University Administrative services	• Technology Score • Communication Score • Business Value Score • Customer Focus Process Score • Leadership Skills Score • Innovation Score • Visionary Leadership Score • Immediate Supervisor Score
Teaching and Learning	• First Year Retention rates • Attrition Rates • Overall Graduation Rate • On time graduation rate • Average time to graduate • Staff-student ratios	• Student Satisfaction Scores - Teaching Quality and Academic Support • Student satisfaction Scores - Non-Academic Services • Graduate employment by Campus, Faculty • Underemployment rate by Faculty

TABLE 1.1: PRODUCTIVITY AND PERFORMANCE MEASURES USED		
Theme	**Measures of productivity and performance**	
	Efficiency	***Effectiveness***
		• Graduate satisfaction with attributes • Open Campus enrolment as percentage of total UWI enrolment • Staff-student ratios
Quality		• Quality of the graduate • Quality of staff • Reputation Surveys
Research	• Number of research publications per FTE Academic Staff • Number of PhD graduates per academic FTE • External Research Income per FTE academic staff (USD) • External Research Income (USD) • Expenditure spent on research	• Number of academic research publications • Number of PhD graduates Postgraduate satisfaction with research opportunities Postgraduate satisfaction with training in research methods • Overall experience of the research programme

1.5. Benefits of Enhancing Productivity and Performance at the UWI

There are several reasons why maximising or enhancing productivity and performance can be potentially beneficial to the University. These include:

- increase in the quantum of outputs without additional cost;
- increase in cost savings due to optimum utilisation of resources;
- realisation of the strategic goals and objectives;
- improvement in stakeholder satisfaction and expectations;
- maintenance/enhancement of quality without the need for additional resources;
- a more globally competitive University; and
- improvement in the productivity of the economies of the region.

In the case of the latter benefit, this is because quality education and knowledge generation are recognised as major factors in promoting sustainable economic growth and improving the living standards of all.

1.6. Key Sources of Data

The statistical information contained in this *Report* was drawn from several sources namely; Campus and University Statistical Reports, Reports of the University Consolidated Audited Accounts, institutional datasets available from Campus/University Business Intelligence systems, institutional research reports prepared by the UOPD or other surveys/studies commissioned by the central administrative arm of the University or the Campuses. Data from the Times Higher Education (THE), U-Multirank (UMR), ranking agencies, were also used in the course of this analysis.

1.7. Assumptions and Limitations

The following assumption was made in preparing this document:

The UWI will continue to operate for some time in an exceedingly competitive higher education sector with reduced funding, structural deficits, rapidly changing technologies, increasing student demands, increased accountability measures from governments and higher expectations from stakeholders forcing the University to critically re-evaluate its mission and operations to satisfy the needs to their stakeholders (governments, funding agencies, private sector, students, etc).

The Report was faced with several constraints namely:

- *Data availability and data gaps*: Data to demonstrate the extent of improvements in productivity and performance in many instances were either inadequate or too general to allow for suitable comparisons. For example, data on research output needs were not captured consistently at the Campus/Faculty levels; specific administrative data were not forthcoming from an overall University-wide output perspective and there were many data gaps due to incompatibility of data-sets and currency of data.
- *Benchmarking:* Attempts were made to incorporate external benchmarking in this publication however, there exists no clear criterion on peer or aspirational universities to inform the choice and thus offer a meaningful comparison. Also, given the gaps in data, it was somewhat difficult to undertake an analysis of trends or carry out extensive internal benchmarking analysis for all areas of focus.

1.8. Structure of Report

The proposed structure of the Report is as follows:

- Introduction
- Review of Literature on Productivity and Performance
- Financial Productivity and Performance Measures
- Administrative Productivity and Performance
- Teaching and Learning Productivity and Performance Measures
- Quality in Teaching and Learning
- Research Productivity and Performance Measures
- Conclusion and Recommendations.

This is the first University *Report* of its type on productivity and performance on the UWI, and it is by no means comprehensive. This *Report* attempts to present a snapshot of the existing institutional and ranking data to showcase valid productivity and performance measures for financial, administrative, teaching/learning, and research sectors. By using these measures, it will provide administrators with better tools for improving the institutions' performance.

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CHAPTER TWO: REVIEW OF RELATED LITERATURE ON PRODUCTIVTY AND PERFORMANCE

This chapter summarises the concepts adopted in the research such as definitions of productivity and performance with particular reference to higher education and the sectoral areas – financial, administrative, teaching and learning, and research. The associated measures for the sectoral areas as identified in the literature are also discussed.

2.1. Rationale for interest in productivity and performance

Universities as educational institutions are involved in knowledge creation, knowledge transfer and knowledge application which supports human capital formation, social innovation (i.e. the contributions of universities to the social, cultural and intellectual life of the communities in which they operate), wealth creation, and economic growth. However, these roles are currently being discharged in an atmosphere of contracting economic resources, increasing levels of competition, a rapidly changing technological environment, and a declining student population after a period of massification. There are also demands for identifying alternative sources of revenue; pursuit of resource mobilisation strategies; appeals for cost control; calls for operational improvements and efficiencies; and demands for data and information to make appropriate strategic and tactical decisions. Many of these strategies suggest that HEIs are making greater forays into economic marketplace and adopting "some type of total quality management (TQM) system to create competitiveness" (Ashraf and Javed 2012, 4). Further, HEIs are increasingly encouraged to engage in knowledge transfer and commercialisation of intellectual property arising from research and to adopt internationalisation strategy.

Public interest in the functioning of HEIs in continental Europe, United Kingdom, and North America has been steadily gaining ground from the 1990s as governments recognised that the expected demand for higher education will require additional allocation of resources from the state and/or a reduction in the operating costs per student (Gates and Stone 1997,1). Productivity in higher education as Sullivan et al (2012,1) noted is becoming imperative as the "current environment of increasing tuition and shrinking public funds" has led to "a sense of urgency …. to better track the performance of colleges and universities in the hope that their costs can be contained while not compromising quality or accessibility." In this environment, concepts such as productivity, efficiency, and accountability become central to discussions on sustainability, costs, and quality of higher education. Maximising productivity, according to B-HERT (2002, 9), was seen as important not only for the higher education sector itself, but also for improving the productivity of the whole economy as knowledge transfer and creation are recognised as major factors in promoting sustainable economic growth and improving the living standard.

Borrowing from strategies used in the private sector, HEIs generally restructured their operations and activities to decrease costs ('do more with less'), while adding value to their existing operations or outcomes. Zamarippa (1994, 18) conceptualised productivity "as the relationship between the outputs generated by a system and the inputs provided to create those outputs." He also noted that the "definition of productivity may also include the terms "efficiency" and, perhaps more importantly, "effectiveness," which measures the total output or the results of performance" (1994, 18). Gates and Stone (1997,3) noted that productivity is often "associated with quality-insensitive cutting or attempts to increase the efficiency of the administrative apparatus within universities." As such, the authors likewise related the productivity concept more to efficiency and effectiveness and less to cost-cutting and posit that productivity must be linked to the goals and mission of the institution. Similarly, the Council of Ontario Universities (2006, 8) saw productivity as not synonymous with cost cutting but as meeting institutional

or system goals in the most *efficient* and *effective* fashion. Gates and Stone (1997,3) and Garrett and Poole (2005, 7) noted that measures to cut costs only address the cost-efficiency dimension of productivity, but productivity in higher education requires sound management practices that also looks at the effectiveness of the organisation, be it an academic department or the entire University. As such, initiatives that reduce costs must also either maintain or improve key measures of effectiveness.

> From the public's perspective (taxpayers'), the productivity of higher education can be thought of as how much individuals and society are getting from the education sector, given the resources they put in. Productivity also reflects whether the system is "wasteful" in some sense. For example, increasing the number of graduates and research publications at a constant or improving level of quality and at the same or reduced cost could constitute an improvement in productivity (Gates and Stone, 1997, 4; B-HERT News 2002, 19).

2.1. Defining productivity

Improving and implementing productivity metrics begins with the recognition of their role in the broader performance assessment picture. However, measuring productivity in higher education is more complicated than the common definition used by economists since HEIs are complex organisations that embody different mandates and missions centered on three main functions: teaching, research and service. Additional goals of HEIs may include enhancing equity and promoting diversity, and regionalism and globalisation.

Productivity measures can be used to assess the extent to which changes in the inputs and processes lead to improvement in performance, and can also be used to determine the value of student learning to the individual and/or society. However, the best productivity measures incorporate indices of both quantity and quality (HEQCO, 2012, 9). Tangen (2005, 36-37) citing Bernolak (1997) noted that:

> *Productivity means how much and how well we produce from the resources used. If we produce more or better goods from the same resources, we increase productivity. Or if we produce the same goods from lesser resources, we also increase productivity. By "resources", we mean all human and physical resources, i.e. the people who produce the goods or provide the services, and the assets with which the people can produce the goods or provide the services.*

Two characteristics are clearly identified: the use and availability of resources and the creation of value. Consequently, productivity becomes a relative concept, that is, it cannot be seen as increasing/decreasing unless a comparison is made to another peer or aspirational institution or trends are tracked. Conversely, Sullivan et al (2012, 1) argued that "the capacity to assess the performance of higher education institutions and systems remains incomplete, largely because the inputs and outputs in the production process are difficult to define and quantify" given the high levels of variability in inputs and outputs. Drawing from the concept of inputs and outputs advanced by OCUFA (2006), Sullivan et al (2012) and HEQCO (2012) noted that quality and quantity of inputs (students, funds, etc.) are subject to variation based upon temporal, economic and environmental changes. Sullivan et al (2012, 22) in noting that the higher education sector is distinct stated that universities differ not so much in its inputs but in the nature of its outputs, that is a "student arrives at a university with some knowledge and capacities that are enhanced on the way to graduation." The output (the student) is not necessarily "indicative of the value of the industry's output to society" as the various stakeholders (government, parents, students, institutions or individual staff members) have different expectations in relation to these goals.

Focusing on inputs-outputs within the higher education sector, Gates and Stone (1997, 3) suggested that productivity is associated with "how much individuals and society get from the education sector, given

the resources they put in." OCUFA (2006, 4), which represents faculty associations from universities and colleges across Ontario, noted that there are "several intangibles in the inputs, processes and outputs with respect to student learning and knowledge advancement" thus, making it incredibly challenging to address productivity issues within universities. It is more useful to distinguish inputs and outputs along functional lines according to Sullivan et al (2012, 29), where inputs are designated as instructional (teaching staff), non-instructional (administration, research and development, amenities and services), and mixed (instructional facilities, laboratory space and equipment, and IT) and outputs include credit hour production and degree attainment as examples. In this regard, productivity measures can be used to guide resource allocation decisions; provide administrators with better tools for improving their institutions' performance; and inform individual consumers and communities to whom colleges and universities are ultimately accountable for private and public investments in higher education (Sullivan 2012, 2).

The higher education industry is seen to be labour intensive. Citing Archibald and Feldman (2011), Sullivan et al (2012, 16) stated that "production processes for colleges and universities rely on human interaction (at least traditionally), nearly fixed amounts of time inputs from faculty and students, and a key role for highly educated, highly compensated employees." The 2012 Sullivan study noted that aggregate and sector-level productivity models have proven to be important for economic and policy analysis and in higher education these models reveal, for instance, whether resource usage per unit of output in particular institutional segments has been increasing or declining. While this approach identifies trends, there will be need to identify the causes of change in the administrative efficiencies which will require more qualitative and analytical information. As productivity measures encompass both indices of quality and quantity, when an HEI attempts to improve throughput or when it hires more adjunct staff, it has to be careful it does not compromise quality. Sullivan et al (2012, 16) citing Goldrick-Rab (2011) argued that "researchers and institutions themselves have rarely paid much attention to whether policies and practices are cost-effective. It should be noted productivity measures can be extended to include aspects of the enterprise that create social value such as, how HEIs create investment in citizens' work careers and the ability to lead productive lives (i.e. impact-level).

Tangen (2005, 37) noted that productivity processes "cannot be said to increase or decrease unless a comparison is made, either of variations from a "standard" at a certain point in time (which can be based on, for example, a competitor or another department) or of changes over time." Improvements in productivity is a caused by five different relationships:

i. Output increases faster than input; the increase in input is proportionately less than the increase in output (managed growth);
ii. More output from the same input (working smarter);
iii. More output with a reduction in input (the ideal);
iv. Same output with fewer inputs (greater efficiency);
v. Output decreases, but input decreases more; the decrease in input is proportionately greater than the decrease in input (managed decline) (Misterek et al 1992 cited by Tangen 2005, 37).

2.3. Defining efficiency and effectiveness

The terms efficiency and effectiveness are seen as integral to both productivity and performance. Efficiency is commonly defined as the minimum resource level that is theoretically required to run the desired operations in a given system compared to how much resources that are actually used, while effectiveness is often linked to the creation of value for the customer and mainly influences the numerator

(outputs) of the productivity ratio (Tangen 2005,41). Efficiency, therefore, is based on time, money or other units and is seen as how much time or value is used in practice compared to its maximum. Effectiveness is seen as the ability to reach a desired result or the degree to which an objective is attained. Epstein (1992, 28) relates effectiveness to the extent to which an institution meets the needs and demands of internal and external stakeholders (Epstein 1992, 28). Consequently, it is possible for an effective system to be inefficient as it is also possible for an efficient system to be ineffective.

Garrett and Poole (2005, 6-7) saw an organisation as efficient if it can increase the level or quality of service without increasing the amount of inputs used, while an organisation was effective depending on how well it meets the demands of its customers. The customers in higher education are students, parents, employers and governments. In the context of higher education, customer demands may include such outcomes as a specialisation of knowledge in a specific area, career assistance and job placement and, probably most important, the graduation of well-educated and productive students (Garrett and Poole 2005, 7). From the perspective of measuring an individual's productivity (i.e. effectiveness and competence in their profession), faculty productivity is seen as how much output a person can produce for a certain period of time with given resources - the better an individual can make use of resources, the higher his/her productivity will be and the better off he/she becomes in his/her career (Vipinosa, 2015, 452). Improving productivity in higher education requires undertaking measures that increase efficiency and effectiveness either in parallel or simultaneously.

2.4. Defining performance

Performance, according to Tangen (2005, 43), "is the umbrella term of excellence and includes profitability and productivity as well as other non-cost factors such as quality, speed, delivery and flexibility." The term according to the author covers both overall economic and operational aspects where the objectives relate to competition and excellence. Based on the typology of high-performance operations that Tangen (2005, 40) offered in his paper, the following were seen to be applicable to HEIs:

- Dependable operations can be relied on to deliver exactly as planned. This eliminates wasteful disruption and allows the other micro operations to operate efficiently; and
- Flexible operations adapt to changing circumstances quickly and without disrupting the rest of the operation.

Noting that performance of an institution is a complex interrelationship between seven performance criteria Tangen (2005, 729-730) listed them as effectiveness, efficiency, quality, productivity, quality of work life, innovation, and profitability/budgetability. Performance can be extended to include adaptability (the extent to which the company is prepared for future changes) according to Tangen (2005, 730) citing Moseng and Bredrup (1993).

Ashraf and Javed (2012, 9-10) suggested that any measurement of university performance requires the following information: the output that universities aim to produce; the input that universities require to produce this output; quantitative measurements of each university's input and output; and the technical relationship between input and output. Citing Johnes (1996), Ashraf and Javed noted that these inputs and outputs could be used to measure a university's performance and proposed four categories of output: (i) output from teaching activities; (ii) output from research activities; (iii) output from consulting services; and (iv) output of cultural and social activities.

2.5. Defining quality

Quality as a concept is also integral to both productivity and performance. It is seen as relating to both processes and products and includes both tangible and intangible factors according to Tangen (2005, 40).

Harvey and Stensaker (2007, 7) suggested that "in higher education, the influence of new public management paved the way for an understanding of quality more influenced by new public management ideas, which led to the establishment of various national (and partly institutional) structures for evaluating or enhancing quality." The typology of quality as Harvey and Stensaker (2007, 7) was noted in Chapter One is further developed here.

Table 2.1: Five ways of defining quality in higher education

Concept	Definition
Exceptional	A traditional concept of quality linked to the idea of 'excellence', usually operationalised as exceptionally high standards of academic achievement. Quality is achieved if the standards are surpassed.
Perfection or consistency	Focuses on process and sets specifications that it aims to meet. Quality in this sense is summed up by the interrelated ideas of zero defects and getting things right first time.
Fitness for purpose	Judges quality by the extent to which a product or service meets its stated purpose. The purpose may be customer-defined to meet requirements or (in education) is usually institution-defined to reflect institutional mission (or course objectives), or indeed defined by external professional bodies. Fitness for purpose is often allied with another so-called definition of quality 'fitness of purpose', which evaluates whether the quality-related intentions of an organisation are adequate. It provides a check on fitness for purpose. As such, fitness of purpose is not a definition of quality *per se.*
Value for money	Assesses quality via return on investment or expenditure. At the heart of the value-for-money approach in education is the notion of accountability. Public services, including education, are expected to be accountable to the funders. Increasingly, students are also considering the value for money of their own investment in higher education.
Transformation	This view sees quality as a process of change, which in higher education adds value to students through their learning experience. Education is not a service for a customer but an ongoing process of transformation of the participant. This leads to two notions of transformative quality in education: enhancing the consumer and empowering the consumer.

Source: Lee Harvey and Bjørn Stensaker. "Quality culture: understandings, boundaries and linkages." Paper presented at EAIR Forum Innsbruck, September 2007, 7.

Citing the example of the quality culture project of the European University Association (EUA), Harvey and Stensaker (2007, 8) noted that the project focussed on the introduction of internal quality management to improve quality levels with well-defined processes that enhance quality and coordinate efforts (which refers to tasks, standards and responsibilities of individuals, units and services). The project also situates universities to be able to respond to external procedures of quality assurance. Equally important, the authors note that quality or quality culture is a tool for asking questions about how things work, how institutions function, who they relate to, and how they see themselves and that it is part of a continuous, iterative and dialectical process.

2.6. Elements of productivity and performance in a University context

Productivity metrics often focus on graduates, the costs per student, teaching workloads, research funding, research output, citation index, innovation, etc. relative to the inputs used (Sullivan 2012, 1). The scope of most productivity studies is generally fixated on the outputs of universities – teaching and/or research – focusing either on individual or institutional attributes or factors; or individual, programme, department, discipline or institutional measures. This sections looks at the concepts of productivity and performance in the various sectoral areas – financial, administrative, teaching and learning, and research - in higher education.

2.6.1. Financial Productivity and Performance

Costs are considered an objective and a quantifiable measure of production processes (Mackle 2016, 6). The author contends that cost accounting is one way to quantify levels and changes in inputs but cautions that costs presents a one-dimension view. Tuition, for instance, is the cost to students, but it does not represent the full cost of producing education services because public and other funding sources are also involved. Costs have to be analysed in relation to the outputs or outcomes generated. To this end, unit costing is seen as fitting into the framework for productivity as it documents inputs involved in production and then aggregating their costs. Macke (2016, 7) adds a caveat that high cost cannot be equated with low productivity or systemic inefficiency and that costs do not necessarily reflect the underlying relationship between inputs and outputs because similar inputs may be priced differently. He cites the example of the engineering programme which is generally seen as an expensive major at four-year public institutions in the United States but produces very well paid graduates. The importance of focussing on comprehensive measures of efficiency or overall productivity was underscored along with an emphasis on the quantity and quality of the sector's inputs and outputs.

Inua and Maduabum (2014, 839) noted that research on the performance of organisations used conventional ratios such as return on equity and return on invested capital or a financial index. However, productivity and performance measures such as profit, rate of return on assets, and unit cost is seen as insufficient for measuring university productivity and performance as "universities are multi-input and multi-output organizations and these measures deal with a single output and input" (Inua and Maduabum 2014, 840). The authors further noted that the "profit and return on asset measure may not be a suitable measure of university performance because output prices of research papers and degree courses are not available and if output prices are available, profit maximization is not one of the stated aims of the university." To this end, the authors suggest using data envelopment analysis or DEA, a non-parametric method which extends efficiency measures from a single input and single output efficiency analysis to multi-input and multi-output situations.[5] They cited several studies on the relative efficiency of US, British, Italian and Spanish universities using DEA and noted that the appropriateness of the DEA method rest on the fact that universities are producers of at least two output — teaching and research. Inua and Maduabum examined performance efficiency in 17 Nigerian federal universities for the period 2006 to 2010 and found that four of the 17 universities adequately utilised their inputs in the production of large number of graduates (output).[6]

2.6.2. Administrative Productivity and Performance

The effectiveness, efficiency and value for money of educational services are central concerns for the higher education sector worldwide (Universities UK 2011, 6). Creating a culture of efficient staff and student administration through the application of evidence-based decisions are by far the greatest challenge faced by the UWI to improve administrative performance. Successful implementation of administrative operational metrics, through goal achievement of the University *Strategic Plan 2012-2017*, can create such a culture of transparency that would drive the culture of accountability to new levels where all University leaders and managers would ensure that their areas of responsibility operate as efficiently and fiscally responsible as possible (Beyer et al 2008, 8).

[5] Inua and Maduabum (2014, 840) noted that in DEA, the efficiency of a Decision-Making Unit (DMU) is measured relative to all other DMUs with a simple restriction that all DMU lie on or below efficient frontiers. DEA provides the relative efficiency of each of the organisation in a given set of other organisations. These DMUs are assumed to be in the business of producing various output by consuming a set of inputs.

[6] The authors used six inputs (number of academic staff; number of non-academic staff; number of admitted undergraduate students; number of admitted postgraduate students; capital grants; recurrent grants) and four outputs (number of graduating undergraduate students; number of graduating postgraduate diploma students; number of graduating masters students; number of graduating doctorate students) to measure the relative performance efficiency of the selected 17 federal universities in Nigeria. See Inua and Maduabum 2014, 843.

According to Cameron (1978, 1) many researchers (Campbell, 1973; Steers, 1975; Warner, 1967; Perrow, 1970; and Dubin, 1976) have been concerned with measuring performance in institutions, yet confusion persist regarding what administrative effectiveness really is and what criteria to apply. Cameron stated that it has been rarely possible to compare studies of effectiveness and performance since few have used common industry criteria for measuring academic and non-academic performances.

Cameron (1978,1) noted that identifying criteria and key performance indicators (KPIs) to measure performance are the major obstacles to the empirical assessment of institutional effectiveness. This is the challenge faced by the UWI, given the governance structure of administratively managing the four geographically dispersed campuses and the Vice Chancellery. Cameron (1978, 1) argued that institutional effectiveness may be typified as being mutable (composed of different criteria at different life stages), comprehensive (including a multiplicity of dimensions), divergent (relating to different constituencies), trans-positive (altering relevant criteria when different levels of analysis are used), and complex (having non-parsimonious relationships among dimensions). According to Gates and Stone (1997, 6), the general approach taken by several universities is to develop measures with KPIs of both efficiency and effectiveness, and then to use these measures together in order to monitor performance improvement at various institutional levels.

2.6.3. Teaching and Learning Productivity and Performance

A clearly stated definition of instructional or teaching and learning productivity has not been identified in the literature surveyed though references are made to how productivity can be measured. There are several productivity and performance measures used to measure teaching and learning.

One of the foremost studies in instructional productivity is the Delaware Cost Study started in 1992, which is an annual analytical tool that benchmarks faculty teaching loads (student credit hours and number of sections taught), direct instructional cost, and externally funded research and service productivity of nearly 700 US institutions. While highlighting efficiency and effectiveness of institutional stewardship of financial and human resources, the Delaware study is "not a full cost model. It is, however, a consistent and reliable tool for assessing the direct costs associated with teaching, research, and service, and their relative relationships with overall faculty activity" (Middaugh 2014,n.p.). Middaugh cautioned that instructional costs are impacted by the extent to which faculty devote time to out-of-classroom activities (e.g. academic advising, institutional committee work, curriculum development, etc.) and there are differences in the extent to which faculty are expected to engage in scholarly activity as a prerequisite to promotion and tenure or access to the volume of external funding for research.

St Aubyn et al (2009), who looked at efficiency and effectiveness of public spending on tertiary education, identified several measures for assessing efficiency in the area of teaching and learning. Several variables were suggested as appropriate measures of teaching and learning output. The measures proposed in this study captured cost, enrolment and completion rates as measures of efficiency, while measures relating to satisfaction, employability and academic quality captured effectiveness.

Looking at the boosting of productivity in higher education, Sullivan et al (2012,61, 63, 64, 89-90) recommended a formula that sums student credit hours and a multiplier that captures the added benefit of achieving academic credentials (degrees or certificates). They, however, cautioned that the proposed productivity model would require the implementation of new measures and data development (2012, 102). They also proposed a multi-factor instructional productivity index for measuring higher education productivity at the segment and sectoral levels. In other words, the authors suggested that in order to

determine productivity, the resources which are used to produce the output needs to be measured as an index.

HEIs are concerned with how to be more efficient especially, in the face of increasing costs and contracting public funds. Cota et al (2011, 4), who examined how institutions can become more productive by increasing graduation rates while controlling overall costs, noted that schools achieve high productivity largely through five strategies: two that increase the number of students completing their degrees (promoting graduation, reducing non-productive credits) and three that keep costs under control (redesigning methods for delivering instruction, running core support and services efficiently and offering on-core services efficiently and selectively). Their study revealed that the cost-per-degree yardstick across all US HEIs represented an average gap of 34 per cent between the most productive quartile and the mean level of productivity (Cota el al 2011,7).

OCUFA (2013, 3, 4) noted that "products of a university, such as student learning, new knowledge, and contributions to the community are not outputs in the usual sense," which makes it "difficult to assess the productivity of institutions or the faculty members who provide the education, conduct the research, and engage in service to multiple communities." The Report suggested explorations of measures of graduate labour market preparedness, individual faculty teaching load, and in particular, attainment rates (function of participation rates – the proportion of the population pursuing post-secondary education – and graduation rates), and research output (the sum total of new knowledge, applied research, and innovation).

Bolli and Mehdi (2011, 20), who examined labour productivity, reviewed productivity in twelve Swiss universities (15 departments organised in six fields) between 1995 and 2007. Using an input-output model, the authors looked at labour inputs that is, full-time equivalent (FTE) employees (Professors, Lecturers, Assistants, and Administrative and technical staff) and the number of enrolled students at the university which captures the teaching output and output by the amount of acquired external funds. The results indicated a negative trend in overall productivity particularly after 2002, with an average rate of about one per cent decline per year (Bolli and Mehdi 2011,1).[7]

Durosaro (2000) in discussing the issue of productivity in higher education in Nigeria focused on the allocation and utilisation of human, material and financial resources vis à vis desirable levels of attainment set for resource allocation and use. He noted in his analysis that while there were some desirable levels of attainment for resource allocation and utilisation there were also some gaps (quota enrolment in particular Faculties, staff ratios, space allocation) in the system that has implications for use-efficiency of university resources (Durosaro 2000, 66).

[7] The authors' analysis indicate that productivity decline coincided with the developments in Switzerland's higher education system following the adoption of the Bologna agreement. These reforms included: (i) transforming the traditional single-degree system (Lizentiat) to a system offering Bachelor and Master programmes, (ii) aggregation of various applied tertiary schools to "universities of applied sciences" (UAS) starting from 1995; and (iii) the introduction of quality assurance guidelines in 2003. Using decomposition analysis the authors showed that productivity decline could be contributed to technical regress but also to a rising inefficiency with a relatively high level of persistence. The results also point to various patterns across different fields. In particular, economics and business departments and law schools show the lowest performance, whereas science departments stand out as an exception with productivity improvements. See Bolli and Mehdi 2011, 1, 2.

Gates and Stone (1997) articulated a four-step approach[8] to analyse productivity in higher education. In discussing measures of efficiency and effectiveness, the authors identified metrics associated with performance based funding in the United States namely; measures based on educational quality, access/diversity/equity, cost minimisation and contribution to state needs. In this understanding of productivity, it is extended to include aspects of the enterprise that create social value such as, how HEIs create investment in citizens' work careers and the ability to lead productive lives hence, a focus more on impact of quality.

Noting that one of the three major outcomes of universities are its graduates, the quality of graduates assesses the ability of the graduates to perform the educational objectives and outcomes of the programme (Al Turki and Duffuaa 2003, 333). In this regard, consideration is given to aligning the objectives of academic departments with the input-process-output model. The focus is thus on the quality of graduates, teaching processes and quality of incoming students.

It is worth noting that Fabrice (2012, 73) noted that "quality teaching initiatives have emphasised the role of teaching in the educational transformative process, have refined the interaction between research and teaching, and have nurtured the culture of quality within the academic community."

Table 2.2 provides a summary of possible productivity and performance measures for this dimension drawing upon above discussions.

Table 2.2: Possible indicators for measuring university productivity and performance in teaching

Type of Indicator	Indicator
Productivity (Efficiency)	Direct instructional expense per student credit hour taught[1]
	Total student credit hours taught per FTE tenured and tenure track faculty[1]
	Class sections taught per FTE tenured and tenure track faculty[1]
	Total student credit hours taught per FTE faculty (all categories) [1]
	Undergraduate student credit hours taught per FTE tenured and tenure track faculty[1]
	External research/service funding per FTE tenured and tenure track faculty[1]
	Number of Degrees Conferred[2]
	Number Of Graduates[2]
	Full-Time Equivalent Student Enrolment[2]
	Faculty Productivity[2, 5]
	Instructional output[3]
	Multi-factor productivity index[3]
	Cost of core services and support[4]
	Instructional design[4]
	Cost of non-core services[4]
	Cost-per-degree[4]
	Enrolment rates[5]
	Completion rates[4]
	Graduation rates[5]
	Attainment rate[5]
	Labour productivity[6]
	Space Requirements[7]
	Unit Cost Per Student[7]
	Operating Costs[7]
	Student-to-Staff Ratios[7]

[8] Gates and Stone (1997.11) outlined the four step approach for achieving productivity improvement in higher education as: (i) define the unit of analysis; (ii) define the objectives of the relevant unit of analysis in a consistent way; (iii) devise measures of efficiency and effectiveness in areas related to the goals; and (iv) link the goals with the identified measures in the developing a strategy for improving and monitoring productivity.

Table 2.2: Possible indicators for measuring university productivity and performance in teaching	
Type of Indicator	**Indicator**
	Time-to-complete graduate degrees[8]
Productivity (Effectiveness)	Academic quality[2, 8]
	Satisfaction (students, graduates)[2, 8]
	Employability[2, 5]
	Throughput rates
	Employers' perception of graduates/employers' survey
	Alumni survey on ideal graduate attributes
Performance	Academic quality[2, 8]
	Satisfaction (students, graduates)[2, 8]
	Employability[2, 5]
	Employers' perception of graduates/employers' survey
	Alumni survey on ideal graduate attributes
	Class of degree
	Academic staff with PhDs

[1] Middaugh. 2014, n.p.

[2] St Aubyn et al. 2009, 12, 13. The indicators can be further disaggregated by programmes and disciplines.

[3] Sullivan et al. 2012, 62, 90. Instructional output, according to Sullivan et al should be a weighted mix of total credits plus additional points for graduation (degree or equivalent) such that: Adjusted credit hours = Credit hours + Sheepskin effect × Completions. The multi-factor productivity index calculates the ratio of changes in outputs (passed credit hours and degrees) to inputs (labour and non-labour factors of production). More specifically, it captures output in physical units (credit hours, degrees) and measures direct labour inputs in terms of FTEs which allows for differentiation of the labour and output categories.

[4] Cota et al. 2011,7.

[5] OCUFA. 2013, 3,4.

[6] Bolli and Farsi. 2011, 20. Using an input-output model, they looked at labour inputs that is, full-time equivalent (FTE) employees (Professors, Lecturers, Assistants, and Administrative and technical staff) and the number of enrolled students at the university which captures the teaching output and output by the amount of acquired external funds.

[7] Durosaro 2000, 66. Utilsing indicators aligned to human resource allocation (student-to-staff ratios, academic-to-non-academic staff ratios), physical space (space requirements) and financial resource allocation (capital and recurrent grants, unit cost per student, and operating costs), Durosaro analysed the distribution of student enrolment by Faculty across Nigerian universities.

[8] Al-Turki, and Duffuaa. 2003, 333-334.

2.6.3. Research productivity

Research productivity can be evaluated on impact, quality, and quantity, which is influenced by the interplay of several factors such as funding, size of academic departments, faculty, and number of research 'stars'. Iqbal et al (2011, 28) noted that the role of universities have changed as a result of the knowledge based economy. The authors, citing a 2000 publication by H. Etzkowitz, E. Schuler and M. Gulbrandsen, noted that universities have been transformed from knowledge producers to knowledge capitalisers and as such, they have a role in the development of research activities (basic or applied) which can result in the delivery of useful commercial elements, work as a problem solving platform for some specifically articulated business need and develop informal social interactions to promote entrepreneurial activities (Iqbal et al 2011, 28).

Citing Wichian et al (2009), Bay and Clerigo (2013, 125) stated that "research productivity could be defined in terms of research product and research effort, to the extent of which a researcher produces." Abramo and D'Angelo (2014, 1129, 1130) saw research productivity as a "quintessential indicator of efficiency in any production system", which is also applicable to a university system. Research performance, according to the authors (2014, 1130), "should be evaluated with respect to the specific goals and objectives to be achieved." Research outputs and intellectual contributions have become important measures of effectiveness for universities. It is also used as a measure in appraisals of faculty performance influencing promotion and tenure, and regarded as key to proving faculty academic qualification and maintaining accreditation (White et al 2012, 585). Further, according to the authors, research outputs are "generally regarded as helping to improve faculty teaching and is viewed as a critical part of the knowledge creation

and dissemination value chain" (2012, 585). As a measure of effectiveness, research productivity and impact is increasingly becoming a consideration for funders in "allocating limited scientific resources and funding" (Neill et al 2015, n.p.). By measuring research productivity and performance, universities are provided with useful information that can deliver valuable insights for long-term strategic planning.

According to Zamarippa (1994, 19) research productivity is commonly documented by publications in refereed journals and, to a lesser extent, funded grants. Zamarippa (1994, 19) and Abramo and D'Angelo (2014, 1129) noted that productivity studies use publications as the unit of measurement. However, caution must be exercised as this constitutes only a single output measure. Zamarippa (1994, 19) suggested that measuring the output of research over a 10-year period would provide a more useful indicator of research productivity as it provides a more stable index of recent productivity.

There are several indicators that can be used to measure research productivity focussing mostly on research output, which is the product of performing research activities (Wootton 2013, 1). OCUFA (2013, 4) proposed measures on research output noting that it "is not simply a question of the number of journal articles or citations an institution receives, but refers to the sum total of new knowledge, applied research, and innovation generated by a university or group of universities." OCUFA (2013, 3, 10) also suggested a broadening of research output (i.e. the amount of new knowledge and innovation that is produced by faculty member) to encompass the sum total of new knowledge, applied research, and innovation.

FIGURE 2.1: EXAMPLES OF RESEARCH ACTIVITIES

Sources: Dundar and Lewis 1998, 611-612; OCUFA 2013, 3; Wootton 2013, 1.

Dundar and Lewis (1998, 609, 610) noted that "research performance is a relatively easy task because of readily available measures such as published books, journal articles, or citation counts across universities." Similarly, Attach (2015, 6) posited that research productivity is almost the only semi-reliable variable in academic work. Despite the straightforwardness of measuring research productivity there are also some limitations. Nevertheless, Dundar and Lewis (1998, 610) indicated that "studies examining research productivity still have remained quite limited…. largely …. due to the measurement problems (i.e. availability of output data at the institutional level and measurement of factors) of both research inputs and outputs."

Aksnes (2012, 4) noted that many factors such as gender, age, academic position and rank, availability of research funds, teaching loads, equipment, research assistants, workload policies, department culture and working conditions, size of department and organisational context contribute to research and citation impact. Bay and Clerigo (2013, 124) posit that research productivity is used as a "criterion for university status, center of excellence, autonomous/deregulated status, institutional quality, and opening of graduate programs" and as such, universities and colleges that are serious in transforming themselves into research institutions have to look at the elements of research culture that contribute to research productivity.

2.6.4. Consideration of indicators of ranking agencies

Academic institutions are nowadays adjudged by their rankings by both internal and external stakeholders and there has been an increasing proliferation of the rankings, listings, and productivity indicators of schools and universities in recent years. The global rankings such as Times Higher Education (THE), U-Multirank (UMR), and University Ranking by Academic Performance (URAP) generally capture performance indicators in the areas of teaching and learning, research and knowledge transfer[9] and finance *(see Table 2.3).* The UWI participates by invitation in the THE and UMR.

TABLE 2.3: SELECTED KEY PERFORMANCE MEASURES OF THREE RANKING AGENCIES

Category	Ranking Agency	Productivity Indicator	Description	Type of indicator
FINANCE - INCOME	**Times Higher Education (THE)**	Research Income (scaled)	Research income from external sources	Efficiency
FINANCE - INCOME	**U-Multirank (UMR)**	Income from international sources	Income from sources located outside the institution's region, including subsidies and revenues from contracts for teaching and research. The sources include both public and private regional entities	Efficiency/ Effectiveness
		Income from regional sources	Income from sources located in the institution's region, including subsidies and revenues from contracts for teaching and research. The sources include both public and private regional entities	Efficiency/ Effectiveness
FINANCE – INCOME DIVERSIFICATION		External income from royalties/copyrighted products	Income from copyrighted products for which the institution holds the copyright. Copyrighted products are manuscripts, designs, software, and goods of an artistic or literary nature protected by copyright law.	Efficiency
		External income from licensing agreements	If a patent is given, the owner of the patent may grant permission to a licensee to use the invention protected by the patent. In the license agreement the financial compensation the licensor will receive from the licensee is specified	Efficiency

[9] There are some associated problems with ranking indicators related to research productivity. For instance, the global rankings count journals that are indexed in main global indices (e.g. Science Citation Index, Web of Science or Scopus, etc) favour only a small number of journals, while the count of research grants may be more apt for the hard sciences (Altbach 2015, 6). Although articles in mainstream scientific journals are easier to evaluate, the author also argues that consideration needs to be given to the changes in knowledge distribution that have taken place such as the expansion of the number of journals and 'open access' journals that have emerged *(the issues of quality and rigour are noted)* and for the humanities and most social sciences "books are important tools for importing knowledge and reporting research" (Altbach 2015, 7). In this regard, how are books weighted in a publication count to arrive at an overall measure? (Johnes and Johnes 1995, 302). Altback (2015, 6) also cautioned that care must be taken when using indicators on external grants as funding for the sciences and biomedical areas is likely more available to scientists, particularly at the top-ranking universities than in fields such as humanities and most social sciences (Altbach 2015, 6,7). Johnes and Johnes (1995, 302) noted that citation analysis has its own problems related to time lags and bibliometric sources included in the main global indices.

TABLE 2.3: SELECTED KEY PERFORMANCE MEASURES OF THREE RANKING AGENCIES				
Category	**Ranking Agency**	**Productivity Indicator**	**Description**	**Type of indicator**
TEACHING	**Times Higher Education (THE)**	Staff to student ratio	FTE Students divided by FTE Staff. 4.5 per cent of the overall ranking score	Efficiency/ Effectiveness
		Income per Academic	Total institutional income divided by FTE academic staff	Efficiency
	U-Multirank (UMR)	Percentage of students graduating within normative period (bachelors and masters)	The percentage of a cohort that graduated after X years after entering the programme (x is the normal ('stipulated') time expected for completing all requirements for the degree)	Efficiency
		Graduate unemployment rate (18 to 24 months prior to reference year)	Graduate Tracer Surveys - the number of graduates which are reported as unemployed. "Unemployed" does not include graduates who went on studying to obtain a further degree. Refers to a period of 18-24 months after graduation.	Effectiveness
		Percentage of graduates employed in region(18 to 24 months prior to reference year)	Graduate Tracer Surveys - the number of graduates who are reported as employed within region. Refers to a period of 18-24 months after graduation	Effectiveness
RESEARCH – VOLUME, INCOME AND REPUTATION	**Times Higher Education (THE)**	Research Income (scaled)	Research income from external sources	Efficiency
		Papers per Academic and Research Staff	The number of papers published in the academic journals indexed by Thomson Reuters per FTE academic, 6 per cent overall	Efficiency
		Citations Impact - Normalized Average Citations per paper	The total number of citations (times cited) divided by the total number of web of science publications 30 per cent of the overall score,	Effectiveness
		Research Income from Industry (per academic staff)	Research income from industry divided by FTE academic staff	Efficiency
RESEARCH AND KNOWLEDGE TRANSFER	**U-Multirank (UMR)**	Number of referred academic publications	Count of peer reviewed academic publications of the institution. This includes PhD dissertations, journal articles and books	Efficiency
		Number of professional publications	A count of all publications published in journals/books/proceedings that are addressed to a professional audience and that can be traced bibliographically. These publications are not peer reviewed as in the category academic publications.	Efficiency
		Number of art related outputs of which concerts, exhibitions, artefacts, media production	Count of all relevant research-based tangible outputs in creative arts /FTE academic staff	Efficiency
		Number of start-up firms	A start-up firm (or spin-off) is a company that initially was the result of a licensing/transferring of technology process from your institution	Efficiency

TABLE 2.3: SELECTED KEY PERFORMANCE MEASURES OF THREE RANKING AGENCIES				
Category	**Ranking Agency**	**Productivity Indicator**	**Description**	**Type of indicator**
		Number of new patent applications filed	The number of new patent applications filed by the institution (or one of its researchers/departments) or the institution's technology transfer office	Effectiveness
RESEARCH INCOME		External research related revenues generated from public sector	Revenues from government ministries, public (national/international) agencies and other public bodies (excluding research councils), awarded competitively for specific research projects and research services carried out by the institution. This category does not include the regular basic public funding of institutions	Efficiency
		External research related revenues generated from industry/private business	Revenues from business and private organisations (excluding non-profit organisations), awarded competitively for specific research projects and research services carried out by the institution. This category does not include consultancies and services (e.g. material testing)	Efficiency
		External research related revenues generated from non-profit organisations	Revenues from private non-profit organisations (such as charities, private foundations and trusts), awarded competitively for specific research projects, consultancies and research services carried out by the institution	Efficiency
CURRENT SCIENTIFIC PRODUCTIVITY	University Ranking By Academic Performance (URAP)	Number of Articles	The measure of current scientific productivity which includes the articles published and indexed by Web of Science	Efficiency
RESEARCH IMPACT		Citation	The measure of research impact and scored according to the total number of citations received	Efficiency
SCIENTIFIC PRODUCTIVITY		Total documents	The measure of sustainability and continuity of scientific productivity. The total document count which covers all scholarly literature including conference papers, reviews, letters, discussions, and scripts in addition to journal articles published	Efficiency
RESEARCH QUALITY		Journal impact total	A measure of scientific impact which is derived by aggregating the impact factors of journals in which a university published articles	Effectiveness
		Journal Citation Impact total	The measure of received citation quality which is based on the impact factors of journals where the citing articles are published	Effectiveness

Note: Some indicators can be both efficiency and effectiveness depending on what strategy it is measuring.

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CHAPTER THREE: FINANCIAL PRODUCTIVITY AND PERFORMANCE MEASURES

The central thrust of the 'Financial Perspective' in the *Strategic Plan, 2012-2017* is to broaden/diversify the funding base, thus relying less on government support. Three strategic themes have been identified to accomplish this thrust and by extension the overall financial health of the institution, namely, *Income Source Diversification, Recapitalisation of the UWI and Efficient Resource Utilisation.*

Over the past few years, serious cash flow problems have been experienced by all four campuses; the result of the continued economic crisis prevailing in the UWI contributing countries. A dual approach towards ensuring its financial viability and sustainability has been adopted involving an aggressive effort at garnering revenue from non-traditional sources complemented by stringent cost containment measures. The focus of this chapter is twofold: one, the overall financial health of the institution is analysed using a spectrum of broad financial ratios and two, selected areas of progress are measured in relation to the stated objectives of the 'Financial Perspective' of the *Strategic Plan 2012-2017*. Table 3.1 shows the various financial ratios to analyse financial health in the UWI, while Table 3.2 shows the various productivity used to evaluate productivity improvements in this Perspective.

Table 3.1: Financial Ratios

Financial Ratio	Methodology	Classification
Primary Reserve Ratio	Expendable net assets / total expenses	Efficiency
Viability Ratio	expendable net assets/ long-term debt	Efficiency
Return on Net Assets Ratio	Change in net assets/ beginning net assets	Efficiency
Net Operating Revenues	Operating surplus or deficit / operating revenues	Efficiency

Table 3.2: Financial Productivity Measures by Strategic Theme and Type of Measure

Strategic Theme	Productivity Measures	Classification
Reduce dependence on government funding	UGC funding as percentage of total income	Effectiveness
Diversification and Expansion of revenue base	% Distribution of income by Source	Effectiveness
	External grant funding per Ft Staff	Effectiveness
Efficient Resource Utilisation – Overall	Per Capita cost per FTE	Efficiency

3.1. Measuring of Overall Financial Health of the University

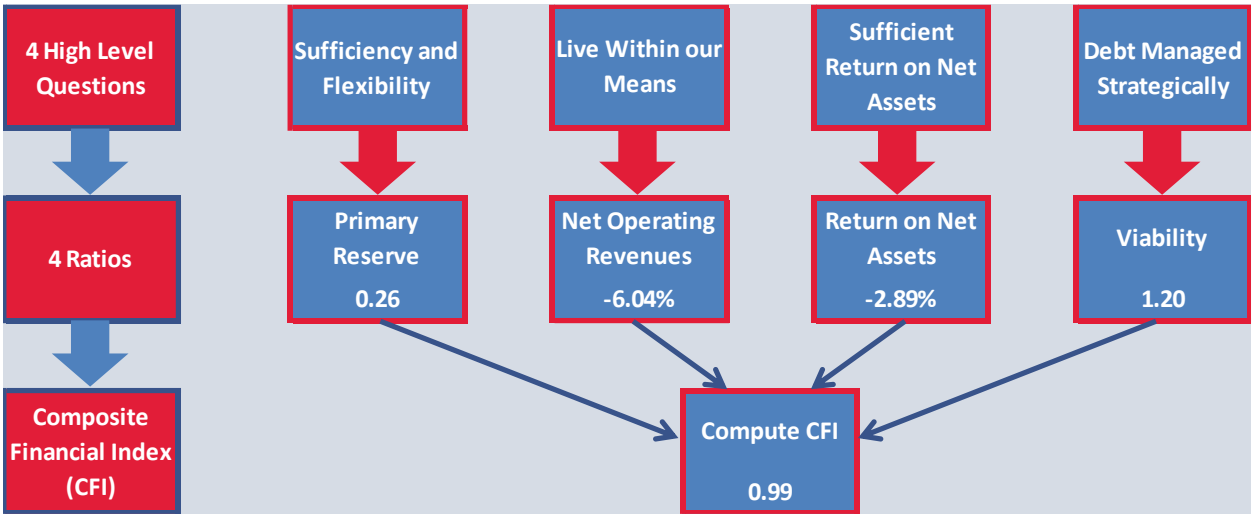
One of the critical success factors in achieving the goals and objectives of the *Strategic Plan* and by extension, the Mission of the University is its financial health. Financial performance indicators are essential to understanding and evaluating the institution's performance in accomplishing its Mission.

The UWI retained Attain LLC, a US management, technology, and strategy consulting firm, to assess its overall operating model as well as selected organisational areas for efficiency and effectiveness. In its final report, *Diagnostic of the University Operating Model*, the consulting firm indicated that measurement of the financial health of the UWI would be driven by the answers to four key questions (2016, slide #10):

- Does UWI have sufficient expendable resources that are flexible enough to meet its mission? (Primary Reserve Ratio);
- Does UWI manage debt consistent with its mission? (Viability Ratio);
- Has UWI obtained sufficient return on all of its equity to support its mission? (Return on net assets ratio); and
- Has UWI lived within its means? (Net operating revenues).

The answers to these questions are combined to create an overall numerical measurement of financial health which is best viewed over a period of time and can be applied historically and prospectively. The scores for financial health indicates the University's ability to withstand downturns in economic positions, make investments in strategic initiatives, and meet existing financial commitments (Attain 2016. Slide #9).

Figure 3.1: Composite Financial Index, 2015



Source: UWI. *Diagnostic of the University Operating Model.* Prepared by Attain LLC. March 2016, slide#17.

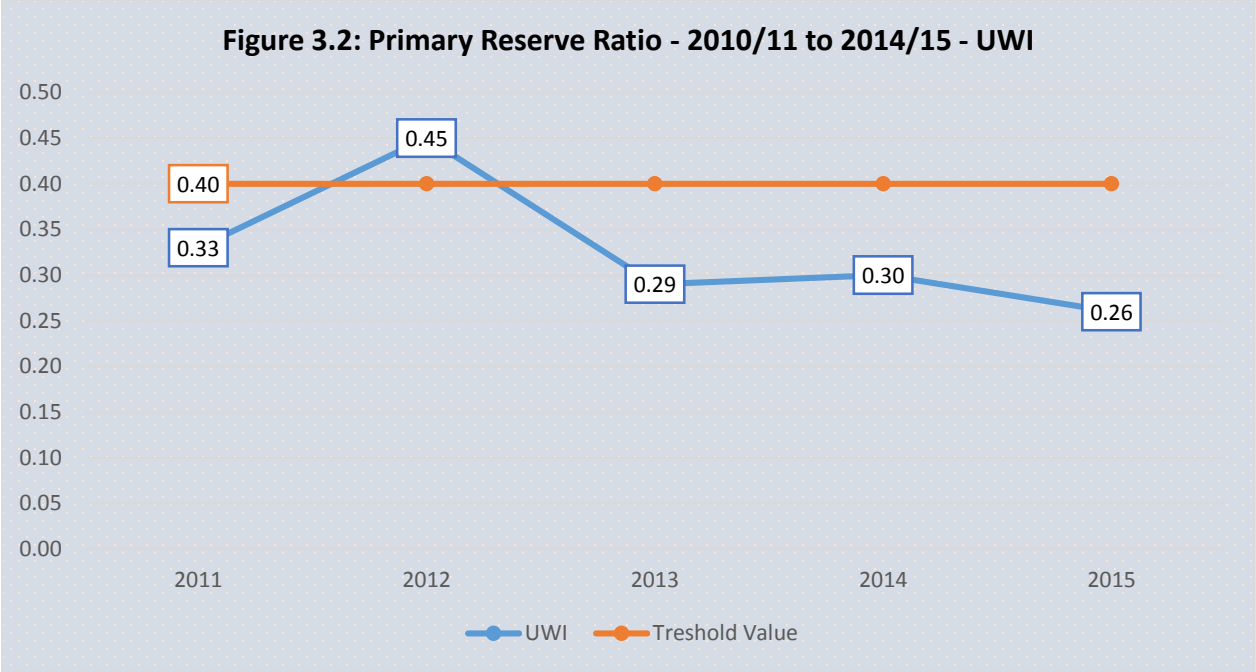
The Report pointed out in its proprietary publication, *Strategic Financial Analysis for Higher Education, (seventh edition)*, that financial analysis begins by asking what is the overall level of financial health of the institution, which is measured by a Composite Financial Index (CFI). This Index is built with the values of its four component ratios:

- *Primary Reserve* – a measure of the level of financial flexibility;
- *Net Income Ratio* – a measure of the operating performance;
- *Return on Net Assets* – a measure of overall asset return and performance; and
- *Viability* – a measure of the organisation's ability to cover debt with available resources

Once each of the four ratios above is calculated, there is an additional process measuring the relative strength of the score and its importance in the mix of creating a composite score. This process results in the production of one weighted score for each indicator and when added together the result is the CFI.

Primary Reserve Ratio - Does UWI have sufficient expendable resources that are flexible enough to meet its mission?

Primary reserve ratio, which is weighted at 35 per cent, indicates the sufficiency of resources and their flexibility to meet the Mission of the University. This ratio is computed by dividing total resources that an institution could spend on operations (expendable net assets) by the total expenses for the year. The significance of this ratio is that if the ratio is low there is insufficient capital or assets to maintain the institutional needs (e.g. the resources needed to maintain the physical plant). A primary reserve ratio of at least 0.40 is recommended. Figure 3.2 shows the University's primary reserve ratio for a five-year period (2010-2015).



Source: Attain 2016, slide#11.

The Attain LLC Report (2016, slide#11) made the following observations:

- The consolidated ratio is below the threshold value, with a downward trend, suggesting that there are insufficient expendable net assets to meet existing programme needs.
- Persistent operating deficits will further denigrate expendable net assets.
- The ratio reduction from 0.30 to 0.26 in 2015 represents BD$41.0M of expendable equity and the additional resources necessary to reach threshold value would be BD$143.6M.

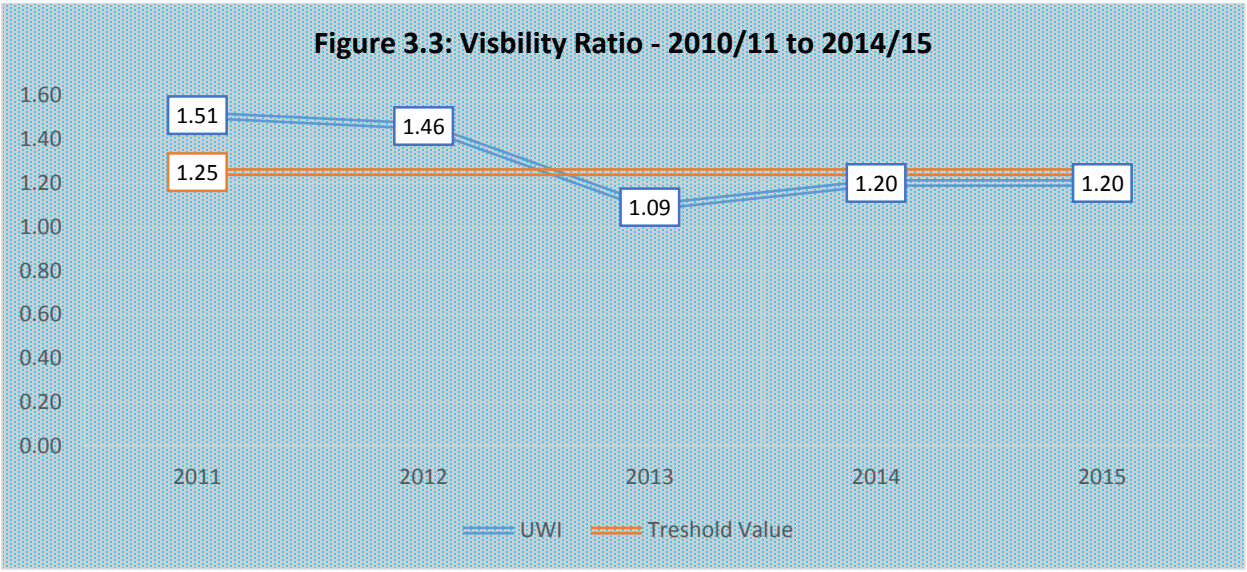
There is little internal resource to provide investment amounts if current operations are to be properly supported.

Viability Ratio - Does UWI manage debt consistent with its mission?

The Viability ratio (weighted 35 per cent) indicates the capacity to repay total debt through reserves and is also measured by dividing expendable net assets by long-term debt. A ratio of at least of 1.25 is recommended. Falling below a ratio of 1.0 will limit the institution's ability to fund new initiatives. The Attain Report noted that with limited expendable net assets, the strategic initiatives funded by debt must have positive operating margins to ensure debt service coverage and strengthening financial health (2016 slide#12). Figure 3.3 shows the Viability ratio for the UWI for five-year period, 2010/2011 to 2014/2015.

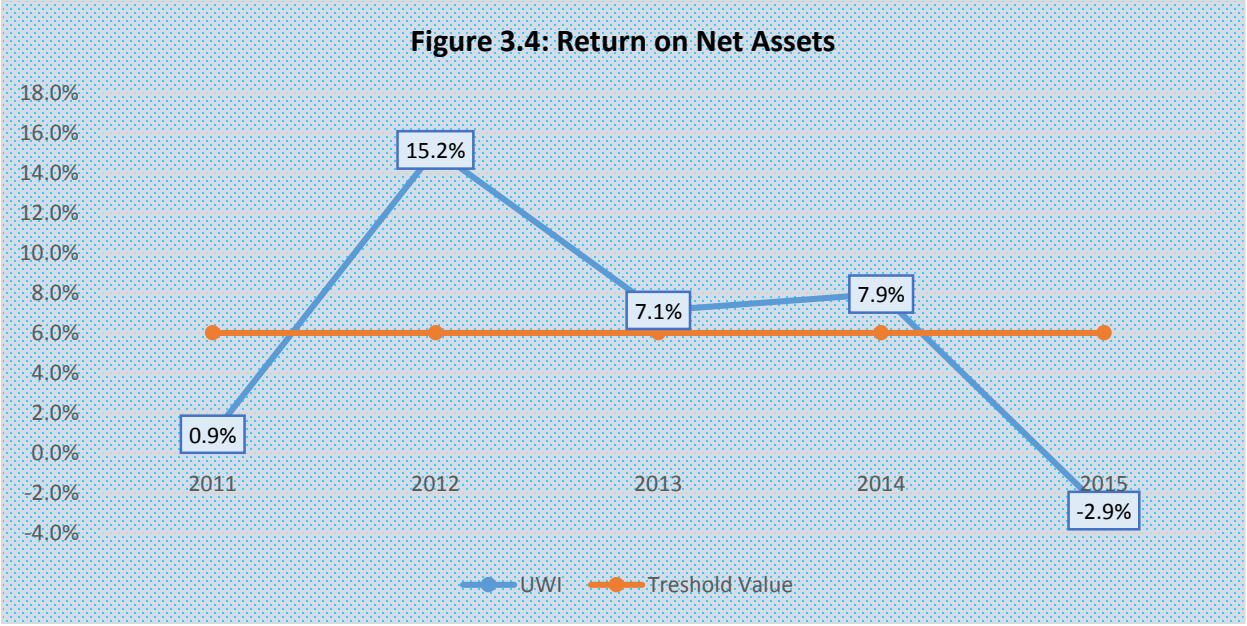
The Attain LLC Report (2016, slide#12) made the following observations:

- The ratio is unchanged from 2014: while debt is reduced by BD$32.6M.
- UWI has reasonable debt capacity, which must be used to meet strategic initiatives.
- With limited expendable net assets, the strategic initiatives funded by debt must have positive operating margins to ensure debt service coverage and strengthening financial health.



Source: Attain 2016, slide#12.

Return on Net Assets Ratio - Has UWI obtained sufficient return on all of its equity to support its mission?
Return on net assets ratio (weighted 20 percent) indicates whether the institution is better off financially this year than last, and is measured by dividing change in net assets by beginning net assets. A threshold of 6 per cent is recommended. If the return on net assets ratio is not 3-4% above inflation for a period of time, there should be cause for concern. Figure 3.4 shows net assets ratios for five-year period 2010/2011 to 2014/2015 for the UWI.



Source: Attain 2016, slide#13.

The Attain LLC Report (2016, slide #13) identified the following observations:

- The return on net assets ratio is the most volatile of the four ratios. This measures the impact of resource deployment and whether that deployment has resulted in return over a period of time.

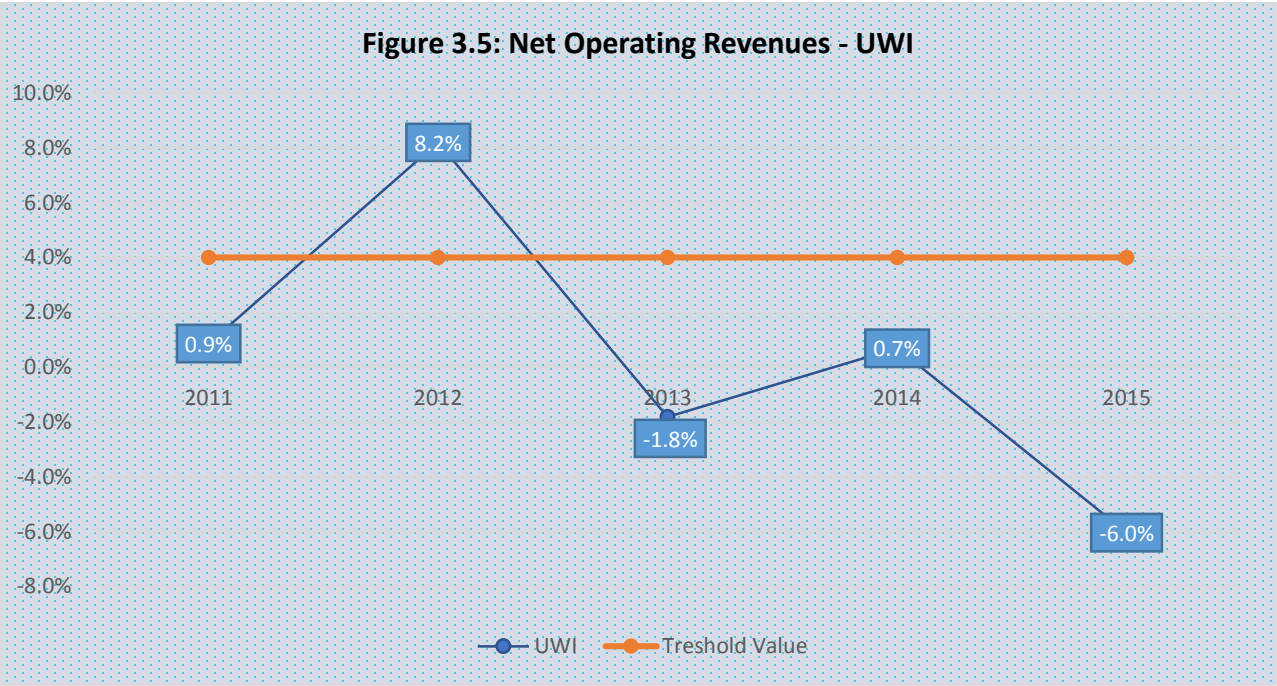
- A strategy to rebuild expendable net assets may include slowing investments in new physical assets. At the same time, it would appear that higher levels of investment in existing facilities is warranted through a capital renewal programme.

Restoring equity levels through return on business activities is a necessary component of fiscal management for the University.

Net Operating Revenues - Has UWI lived within its means?

Net operating revenues ratio indicates whether the institution is living within available resources and is measured by dividing operating surplus or deficit by operating revenues. This ratios (like the primary reserve) has a 35 per cent weighting in the computation of the CFI score. A threshold value of 6 per cent is recommended. Figure 3.5 shows net operating revenues for five-year period 2010/2011 to 2014/2015 for the UWI.

Figure 3.5: Net Operating Revenues - UWI



Source: Attain 2016, slide#14.

The following observations were made by Attain LLC (2016, slide#14):

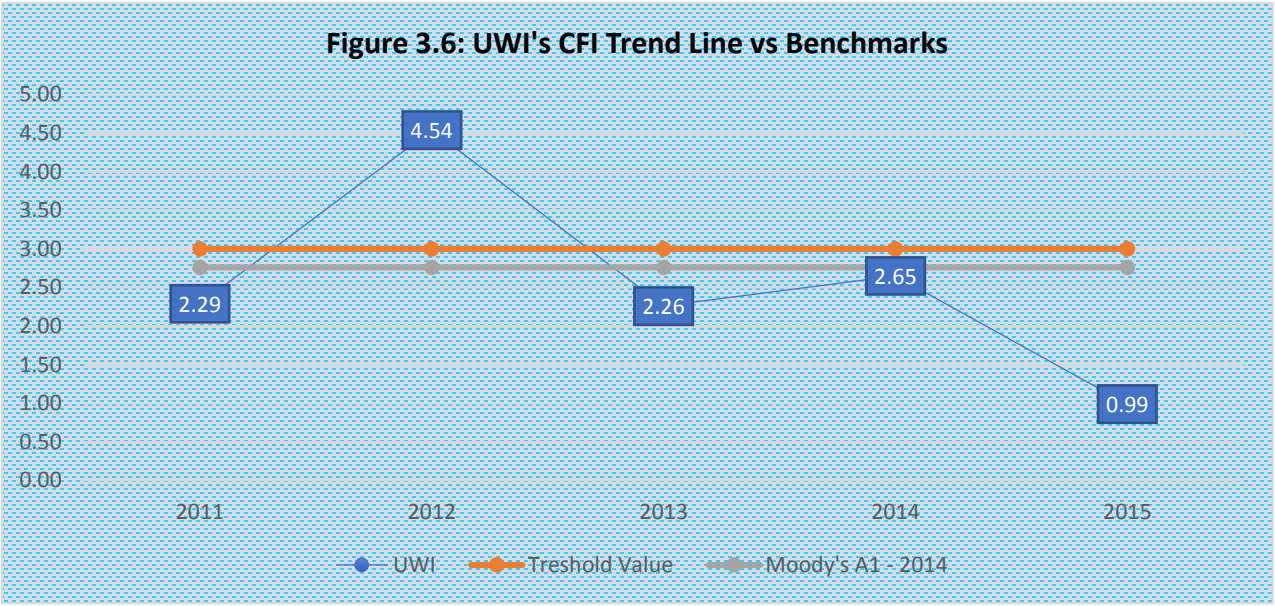
- Annual operations have been volatile over the five-year period, with a substantial deficit in 2015 of BD$57.5M, driven by several factors, including a provision for impaired receivables of BD$98.6M and employee benefits obligations.
- Expenses increased from 2011 to 2015 by 9.5 per cent with revenues increasing by only 2.5 per cent.
- Other current revenue streams appear incapable of making up for revenue declines in both Government and Tuition, which total BD$39.6M from 2014 to 2015.

The financial challenge is that the University has developed a structural deficit which can best be addressed by modifying operations.

Measuring overall financial health – CFI scores

The CFI is shown in Figure 3.6 and the results indicate instability in that the UWI is currently below the threshold level (3.00) and thus, in a precarious position. The following general conclusions drawn by Attain (2016, slide #18) are as follows:

- At a score of 0.99, the institutional discussion and focus should be committed to *considering substantial programmatic adjustments.*
- At this CFI it would appear the University has overall commitments that are beyond its financial capacity to respond.
- A key element of operating weakness is the extensive mission that appears to have unfunded mandates, making margin generation difficult.



Source: Attain 2016, slide#18.

3.2. Measuring productivity at the UWI: Financial Perspective

This section will examine the strategic themes from the viewpoint of efficiency and effectiveness.

3.2.1. Strategic Theme: Income Source Diversification – Reducing dependence on government funding

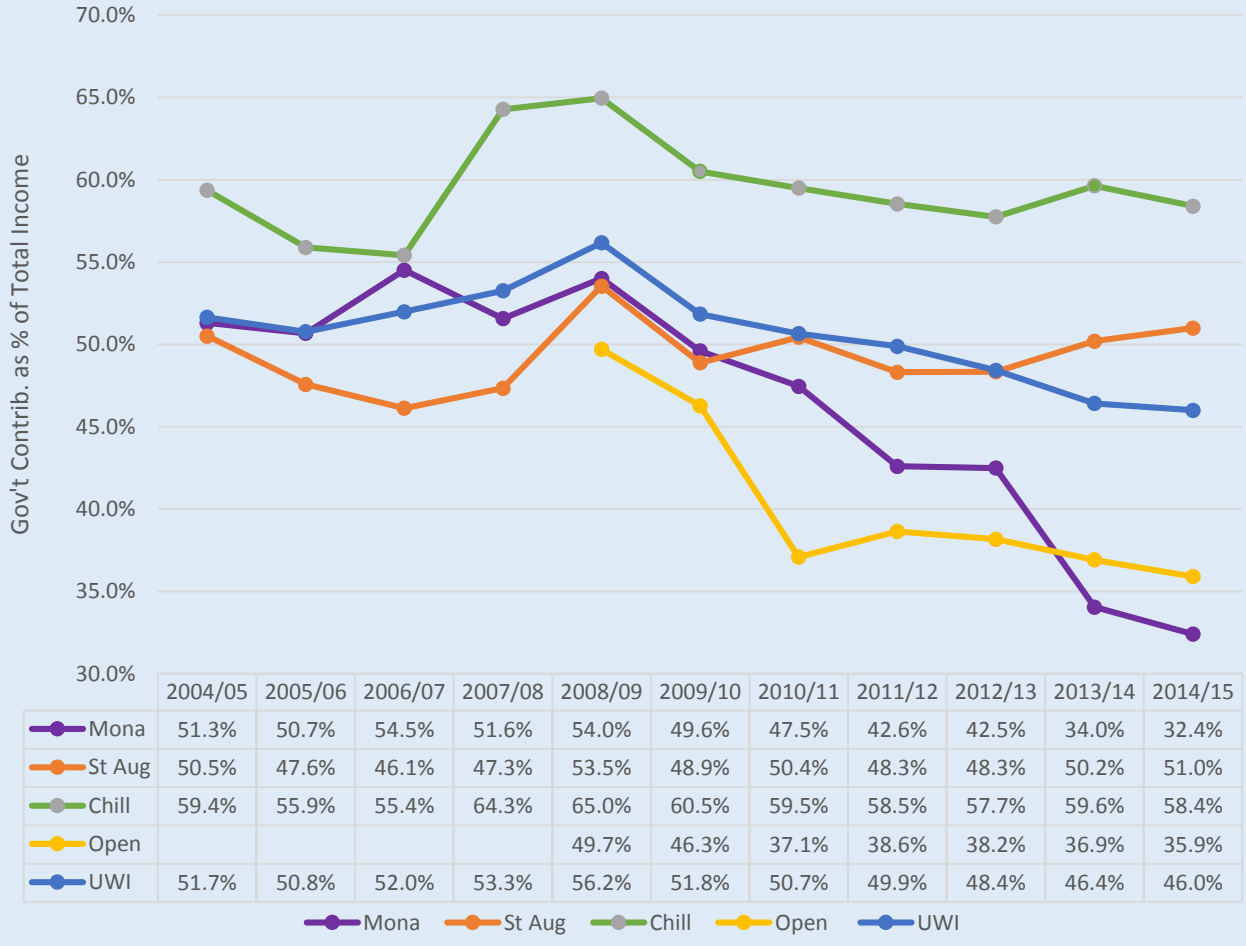
Reducing dependence on government funding is a key strategy of the University in its quest to remain viable. Limits are being placed on public funding, leading to greater pressure on the University to fend for itself financially. One of the key strategic goals of the *Strategic Plan, 2012-2017* is to reduce reliance on government funding by diversifying and expanding the funding base of the UWI. This would require boosting productivity, optimising the use of under-utilised plant and equipment as well maximising the use of human capital. Specific measures include: increasing fee paying programmes, rental of facilities, commercialisation of research, expanding consulting services, increasing external grant funding, etc.

Productivity Measure - UGC funding as percentage of total income

Using data from audited accounts, the contribution from West Indian Governments is measured as a percentage of total income**.** Figure 3.7 shows that over a ten-year period (2004/2005 to 2014/2015) there has been some measured success for the UWI based on the fact that the percentage of government contribution has been reduced from 51.7 per cent in 2004/2005 to 46.1 per cent in 2014/2015.

At the campus level, the ratio varied, showing the Mona Campus to be the most successful and the least dependent by moving from 51.3 per cent in 2004/2005 to 32.4 per cent in 2014/2015. This is in stark contrast to the Cave Hill Campus which remained consistently high around 58 per cent with only marginal improvement and to a lesser extent the St Augustine Campus which remained fairly consistent at around 50 per cent. The Open Campus has been declining, moving from 49.7 per cent in 2008/2009 to 35.9 per cent in 2014/2015.

Figure 3.7: UWI's Depndance of Government Contribution (% of total Income) - Financial Years 2004/2005 to 2014/2015



	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Mona	51.3%	50.7%	54.5%	51.6%	54.0%	49.6%	47.5%	42.6%	42.5%	34.0%	32.4%
St Aug	50.5%	47.6%	46.1%	47.3%	53.5%	48.9%	50.4%	48.3%	48.3%	50.2%	51.0%
Chill	59.4%	55.9%	55.4%	64.3%	65.0%	60.5%	59.5%	58.5%	57.7%	59.6%	58.4%
Open					49.7%	46.3%	37.1%	38.6%	38.2%	36.9%	35.9%
UWI	51.7%	50.8%	52.0%	53.3%	56.2%	51.8%	50.7%	49.9%	48.4%	46.4%	46.0%

Source: UWI. *Financial Report and Consolidated Accounts,* 2005-2015.

In light of the worsening economic conditions in many Caribbean economies, it is important that all campuses continuously strive to reduce reliance on government funding. If we are to use the overall University ratio as the benchmark, this would suggest that the gaps between Cave Hill and St Augustine Campuses are significant enough to recommend a reduction in the reliance on government funding by enhancing productivity through implementing policies that focus on maximising use of plant and equipment and harnessing the full potential of human capital.

3.2.2. Strategic Theme: Income Source Diversification – Diversifying and expanding the revenue base

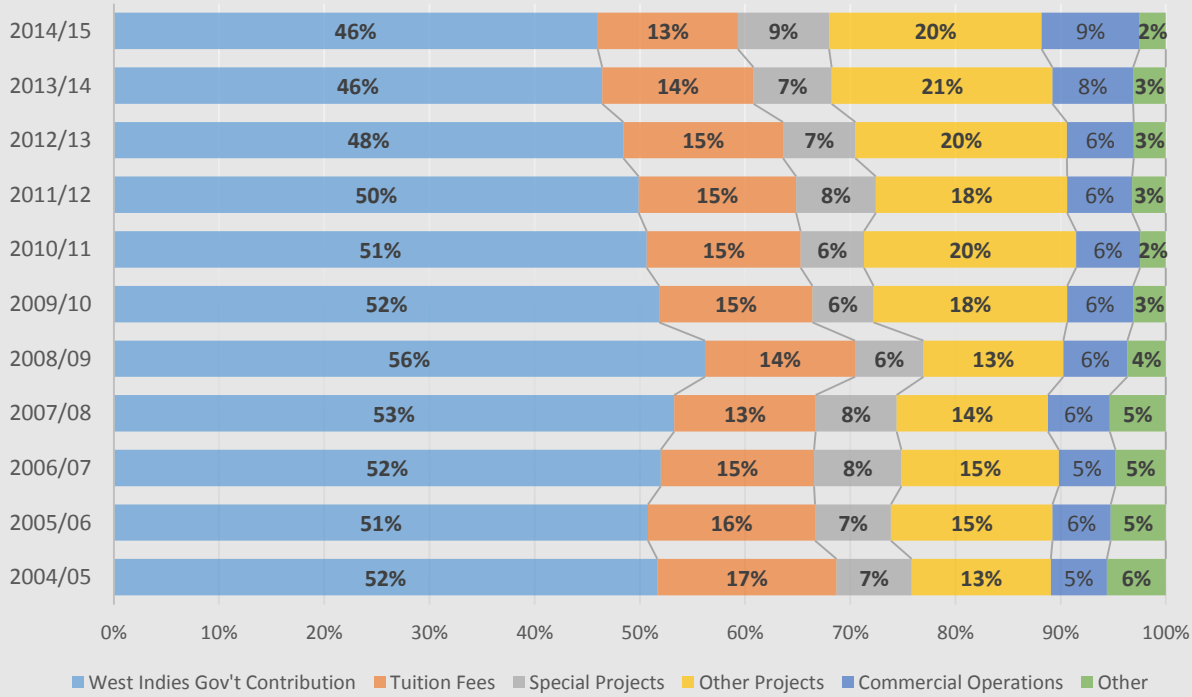
Expanding to a more diversified funding base is critical to the survival of the UWI in the medium to long term. This would require significantly increasing income generation from commercialisation, knowledge transfer, tuition fees and other external sources of funding.

Productivity Measure: Percentage Distribution of Income by Type

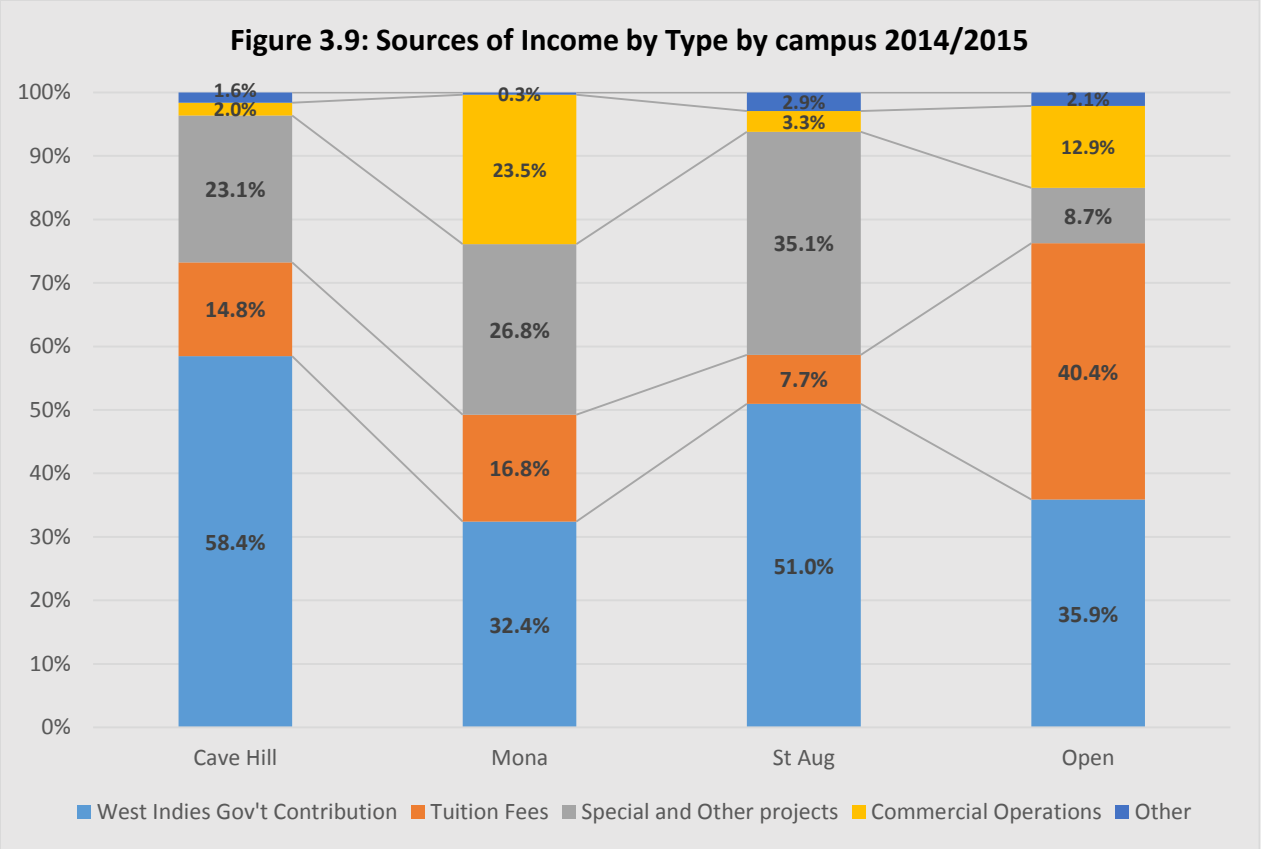
According to the University's *Financial Reports and* Consolidated *Accounts*, the main sources of income in ascending order are contributions from West Indian Governments, other projects, tuition fees, special projects, commercial operations and other miscellaneous.

Diversifying and expanding the funding base is measured by the percentage distribution of income by type over time. Figure 3.8 shows that some progress has been made in terms of diversification as evidenced by the fact that percentage income for Special and Other Projects increased from 20 per cent in 2004/2005 to 29 per cent in 2014/2015, while the share for commercialisation increased from 5 per cent to 9 per cent for the same period. The share of income from tuition fees appeared to have declined from 17 per cent to 13 per cent and this must be cause for some concern. On a campus basis, as shown in Figure 3.9, there were significant variations. In terms of non-government income, Cave Hill Campus was at 41.6 per cent compared to 67.6 per cent at Mona Campus. Income from tuition fees was highest for the Open Campus at 40.4 per cent compared to 7.7 per cent for the St Augustine Campus, while income from commercial operations was 23.5 per cent for Mona Campus compared to 2 per cent for Cave Hill Campus.

Figure 3.8: Sources Of Income By Type - UWI



Source: UWI. *Financial Report and Consolidated Accounts,* 2005-2015.



Source: UWI. *Financial Report and Consolidated Accounts,* 2015.

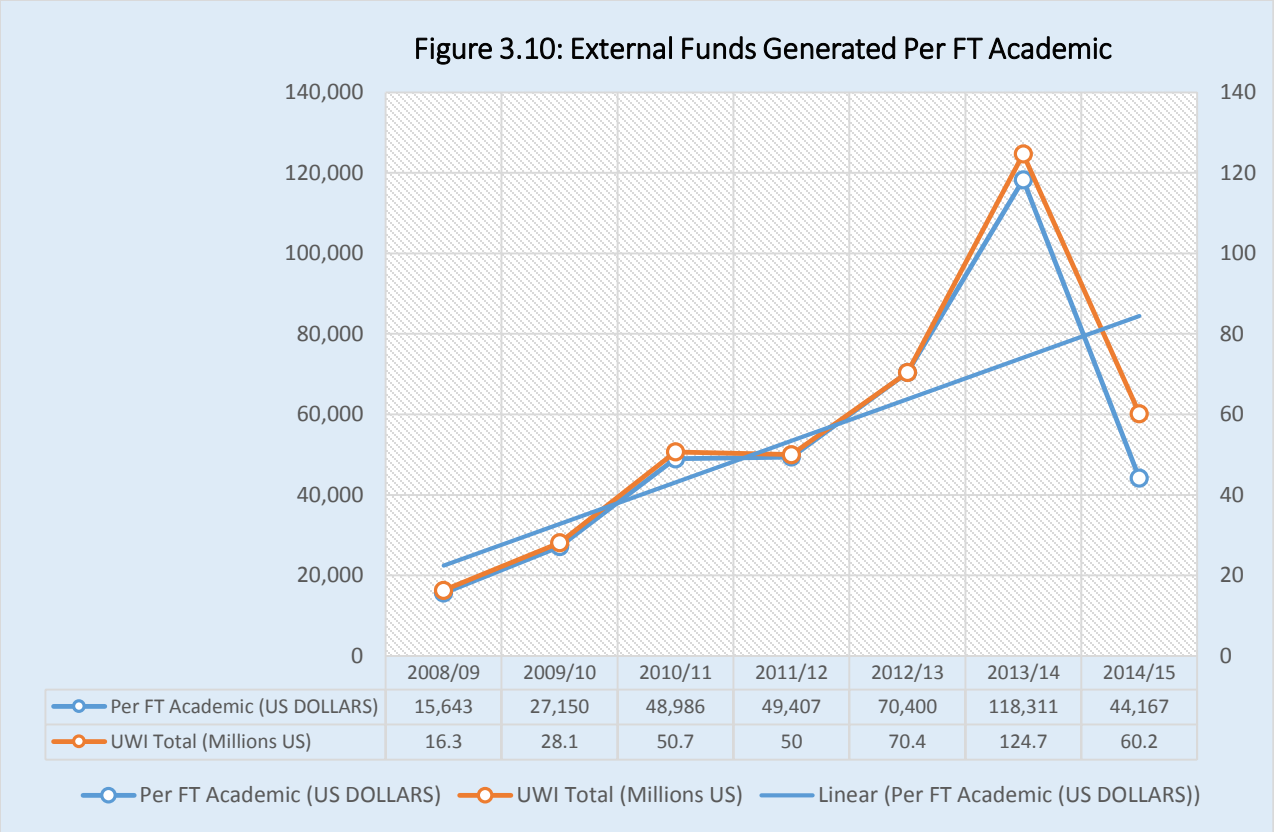
The university needs to continue to diversify and strengthen its funding base. Overall, there is significant scope for increasing income from commercial operations, inclusive of research commercialisation, contracted research, product development and merchandising, etc. At the campus level, comparative data for 2013/2014 shows differential progress and weaknesses across campuses. The St Augustine and Cave Hill Campuses need to increase its share of revenue generation from commercial operations and tuition fees, while the Open Campus needs to increase its share of income from projects.

Productivity Indicator – Externally Funded Grants per FT Academic Staff

A critical area in expanding and strengthening the funding base is externally generated funds for special projects. External funding includes research and other project funding.

Externally generated funds per full-time (FT) academic staff has shown an overall increase over the observed period despite the fact that there was a significant decline in 2014/2015 from the previous year, moving from US$118,311 per FT Academic staff in 2013/2014 to US$44,167 in 2014/2015 *(see Figure 3.10).*

Outside of the contribution from West Indian Countries, income from external grants for special and other projects is the second largest source of University Income. It is therefore important that the University continue to enhance productivity in this area.



Source: UWI. *Financial Report and Consolidated Accounts,* 2009-2015.

3.2.3. Strategic Theme: Efficient Resource Utilisation – Overall cost per FTE student

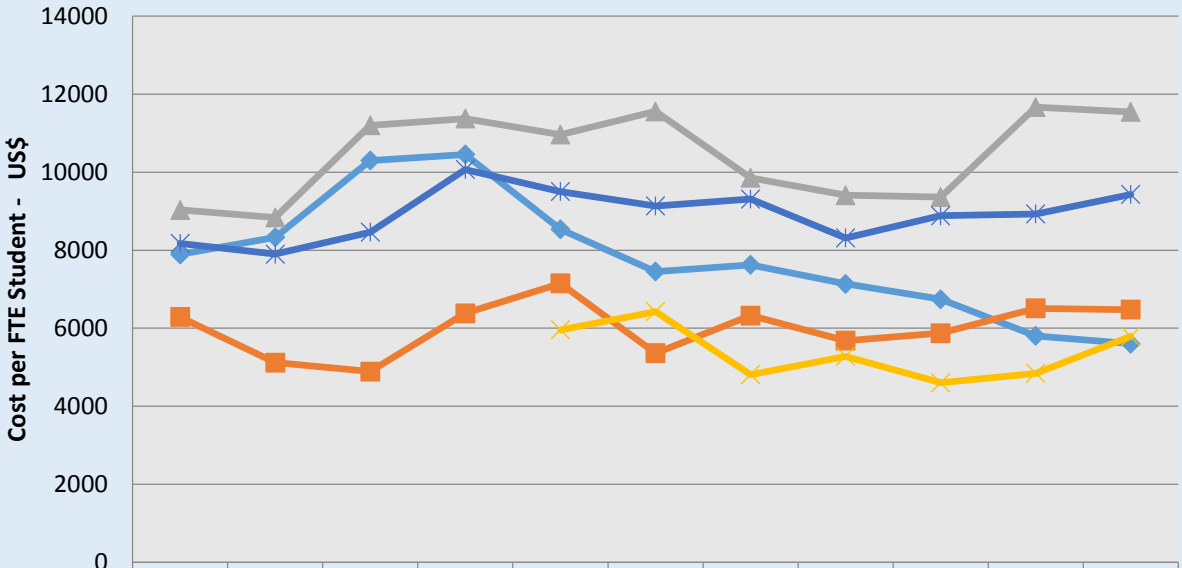
In higher education, one of the most important single-input (financial) to single-output productivity measure is the expenditure per student educated (cost per FTE student). It must be noted that while measures like these are useful in certain contexts, they are somewhat limited in terms of measuring the quality of the product and must be used in sync with other measure of effectiveness and quality.

Productivity measure – Cost per FTE Student

Cost per FTE student is commonly used measure of overall efficiency. This measure is used by the UWI to determine tuition fees, where tuition cost is estimated at 20 per cent of per capita cost. Higher cost per FTE student not only flags issues of cost efficiency and effectiveness within the economic system, but also implies an additional cost burden to students and/or family as well as the government. The measure is defined as the total operating expenditure comprising of teaching and teaching related expenditure divided by full time equivalent students. Operating expenditure specifically comprises administration, central and departmental expenditures as indicated in the audited accounts of the University. Full time equivalent students' is the total on-campus student population weighted by using a conversion factor of 0.5 for each part-time student.

Figure 3.11 shows that cost per FTE student for the UWI fluctuated over the ten-year period, but overall, still showed an increase, moving from US$8,177 per FTE student in 2004/2005 to US$9,430 in 2014/2015. At the campus level, Cave Hill Campus spent more per FTE student than any other campus, moving from US$9,030 in 2004/2005 to US$11,544 in 2014/2015 with the increases in the last two years mainly due to declining enrolment. The Mona Campus was able to reduce spending per FTE student from 2007/2008 onwards, while the Open Campus showed comparatively low cost per FTE.

Figure 3.11: Cost Per FTE Student for UWI and by Campus in US$ - 2004/05 to 2014/15



	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Mona	7893	8330	10298	10456	8537	7454	7627	7135	6745	5805	5604
St Aug	6289	5120	4892	6381	7152	5363	6325	5682	5873	6510	6477
Chill	9030	8840	11202	11374	10962	11558	9856	9407	9364	11668	11544
Open					5962	6426	4813	5278	4604	4847	5791
UWI	8177	7902	8460	10069	9504	9135	9310	8313	8883	8929	9430

Note: There were significant variations in the exchange rates, from JA$117.4 to US$1.00; TT$6.36 to US$1.00; and BDS$2.00 to 1 US$1.00 in 2014/2015.
Source: UWI. *Financial Report and Consolidated Accounts,* 2005-2015.

In academic year 2014/2015, the disparity between Cave Hill Campus and the other campuses was quite significant and must be addressed. The reintroduction of tuition fees at Cave Hill in 2014/2015 and the resulting impact on enrolment levels will further exacerbate the situation. It is interesting to note that the Open Campus had the lowest cost per FTE student which is probably due to the fact that distance education on a per capita basis, cost less than face to face teaching and the UWI may wish to consider expanding distance programmes as a means of reducing cost. Of particular interest is the disparity in per capita cost in US dollars across the four campuses.

3.3. Conclusion

Based upon the diagnostic study by Attain LLC discussed in Section 3.2 of this chapter, the following is a summary of some of the recommendations made in the Attain LLC Report:

- The financial condition of the University would indicate the existence of a persistent structural deficit (these occur when repeatable revenues are less than committed or programmatic expenses) that needs to be cured mostly by a reallocation of resources and improvement in operational efficiency. To this end, it would require:

    - An adjustment in annual operations to effect sustainable change is needed. A minimum of BD$75 million is suggested by Attain LLC.
    - This would result in the desired operating margin of 5 per cent each year. This margin is required to ensure: (a) availability of amounts needed to restore depleted equity; (b) financial ability to withstand economic downturns; and (c) resource availability for investment in strategic initiatives
    - Traditional revenue streams related to government and students appear maximised, and thus, requiring alternative revenue streams are needed to supplement these strained sources.
- Substantial changes in the ways services are delivered will be necessary to make impactful changes to spending patterns
- There is a mismatch between strategy and budgeting and as such, the allocation of resources should be aligned to institutional strategy. This would entail understanding the resources that can help avoid a strategic gap and formalise a priority planning process, and ensure that investments are affordable and will not create structural deficits.

Identifying/developing baseline data and monitoring the performance of the financial health of the institute remains critical.

The productivity indicators advanced for the 'Financial Perspective' in the current *Strategic Plan* are selective and somewhat limited based on availability of data from the audited financial accounts of the University. Clearly, there is a need for more detailed strategic financial data to provide a more meaningful analysis of productivity at the UWI.

Based on the results presented in this section, some progress has been made in terms of reducing reliance on government and diversifying the funding base, however a lot more needs to be done, particularly in the following areas:

- reduction of cost per student;
- further reduction in reliance on public funding;
- increase income from commercialisation, including research; and
- increase externally funded special projects, primarily from international sources.

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CHAPTER FOUR: MEASURING PRODUCTIVITY IN THE UWI ADMINISTRATIVE SERVICES

The efficient administration of university operations and services requires strategic leadership and management of human resources, systems, operational processes and policies to deliver on the operational effectiveness and performance improvements. This also entails the implementation of administrative metrics to focus on operational processes, student and staff services, continuous process improvement, and employee engagement in all university administrative functions.

According to Gates and Stone (1997, 3), productivity improvement is a lot more than cost cutting, and an ability to do more with less. It is a critical examination of goals and objectives, and the implementation of long term productivity initiatives based on the strategic objectives of the institution. Therefore, the concept of administrative productivity in HEIs should take into consideration other dimensions, such as, efficiency and effectiveness and be linked directly to the University's Vision, Mission and Strategic Goals to ensure that a structured framework for analysis is monitored and continuously evaluated by the UWI.

4.1. Methodology

The development of a productivity framework to measure the administrative services of the UWI is necessary. This framework will serve as a useful starting point for further discussion on a series of steps to assist university policymakers in developing productivity improvement strategies. The methodology for the performance analysis in administrative services comprises four key steps involved in continuous improvement: (i) to define and align administrative-related performance variables to the University strategic goals; (ii) delineation of the themes and goals within respective UWI administrative-related Perspectives that drives efficiency and effectiveness; (iii) identifying key performance measures that relate to the themes and goals; and (iv) analysis of data to measure performance (adapted from Gates and Stone 1997, 11).

4.2. Defining and Aligning Administrative Related Variables

The first step in defining and aligning administrative related performance variables to the University strategic goals is to identify the respective Balanced Scorecard (BSC) Perspectives in the *UWI Strategic Plan 2012-2017* that addresses human resources, systems, operational processes and policies that can deliver on operational effectiveness and productivity improvement. The *UWI Strategic Plan 2012-2017* has two Perspectives that addresses strategic alignment to administrative services, namely, (i) 'Employee Engagement and Development' or EED and (ii) 'Internal Operational Processes' or IOP.

These two BSC Perspectives and "their corresponding themes, goals and objectives are viewed as linked together in an integrated strategic framework, and each element is integral to the process of achieving the UWI Mission and Vision" (UWI Strategic Plan 2012, 9).

4.3. Delineation of Themes and Goals

The first step in identifying measures of efficiency and effectiveness in areas related to administrative productivity is to link the theme and goals (identified in the two BSC Perspectives) with the identified variables in developing a strategy for improving and monitoring productivity (Gates and Stone 1997, 12).

4.3.1. Employee Engagement and Development Perspective

The BSC Perspective EED is a realisation that engages both academic and non-academic employees, and is an essential ingredient of strategic performance management and success that can drive institutional productivity (*UWI Strategic Plan 2012-2017*). The EED Perspective addresses three main themes, namely: (i) Competency-based Development; (ii) Culture of Employee Engagement; and (ii) Strengthening Performance Management Systems. Each theme with its corresponding goal is shown in Table 4.1.

Table 4.1: Employee Engagement And Development	
THEME	**GOALS**
Competency-based Development	Improve leadership and management capabilities and job competencies of all employees so that they can effectively fulfil their roles
Culture of Employee Engagement	Create an organisational environment that promotes personal growth and development for employees and positive cognitive, emotional and behavioural states directed toward optimum organisational outcomes
Strengthening Performance Management Systems	Improve, upgrade and align all HR Systems

4.3.2. Internal Operational Processes Perspective

The BSC Perspective, IOP, in the *UWI Strategic Plan 2012-2017* addresses the critical organisational activities and processes that impact on the quality of service that the UWI provides to its various stakeholders. The IOP Perspective has three main themes, namely: (i) Efficient and Effective Academic and Administrative Processes; (ii) Governance Arrangements; and (iii) Management Structures. Each theme with its corresponding goal is shown in Table 4.2.

Table 4.2: Internal Operational Processes	
THEME	**GOAL**
Efficient and Effective Academic and Administrative Processes	Re-engineer academic and administrative operational Processes and procedures to make them simpler, more transparent, efficient, and effective to achieve optimal stakeholder satisfaction within and across campuses
Governance Arrangements	Integrate improved governance systems into the UWI's operations
Management Structures	Improve the effectiveness of executive and senior management structures at campus and University levels

4.4. Identifying Key Performance Measures

Data derived from the UWI 2012 and 2015 Employee Engagement Surveys were used to identify the performance variables for the UWI administrative services *(see Box 4.1)*. A factor analysis[10] was performed on the survey data by *Infotools Limited*, using a three dimensional approach, namely, *emotional drivers, rational drivers* and *operational excellence* to identify performance levels in the University.

According to Johnson and Wichern (2002), a factor analysis is a statistical method used to describe variability among observed, correlated variables in terms of a potentially lower number of unobserved variables called factors. The goal of a factor analysis is to characterize the P variables in X in terms of a small number M of common factors F, which impact all of the variables, and a set of errors or specific factors ε, which affect only a single X variable.

[10] The factor analysis methodology was not available from *Infotools Limited at the time of writing this report.*

Information will also be used from the 2010 and 2013 Undergraduate Student Satisfaction surveys and the 2013 Postgraduate Student Satisfaction survey, which looked at student feedback with respect to their satisfaction and experience with university services.

Box 4.1: About the UWI Employee Engagement Survey

The University of West Indies commissioned two Employee Engagement surveys in 2012 and 2015. The two surveys were conducted by consultants from *Infotools Limited* based in Boston, Massachusetts. The Employee Engagement surveys developed by the consultants, were designed to measure emotional and rational drivers, and operational excellence of staff on the four Campuses of the University and encouraged staff to share their perspective and recommendations with a view to close the engagement gap.

The commissioning of the survey was part of the change leadership programme which represents the tangible commitment of the University's Executive Management Team to 'model the way' in addressing leadership development and employee engagement to promote improved trust, collaboration, communication, accountability and servant leadership at all levels.

Source: The UWI Intranet News, Employee Engagement, 2012-2013.

4.5. Productivity Analysis

This section looks at productivity and performance measures for EED and IOP Perspectives.

4.5.1. Employee Engagement and Development (Employee Feedback)

The Perspective EED involves the active participation of both academic and non-academic employees in the delivery of efficient educational services. Employee engagement can be defined as a heightened emotional and intellectual connection that an employee has for his/her job, organisation, manager, or co-workers that, in turn, influences him/her to apply additional discretionary effort to his/her work (Conference Board 2006, 5). Survey results from the 2012 and 2015 Employee Engagement Surveys were used to analyse the performance variables in the EED Perspective. The scores for the 2012 and 2015 employee engagement surveys remained relatively the same, save and except the performance variable - *Process* – which recorded a **Moderate** rating in 2012 compared to a **Poor** rating in 2015 (*see Table 4.3*).

The three performance variables identified to measure *Competency Based Development*, namely, Visionary leadership, Nature of Work and Line of Sight revealed a weighted mean score of 55. This score suggests less than good employee engagement and process demands. Scores in this category suggest areas of weakness or developing weakness (Employee Engagement Survey Report, 2015). *Competency Based Development* received an overall rating of **Moderate** performance.

For the strategic theme *Culture of Employee Engagement*, the three performance variables namely, Growth Opportunities, Trust and Integrity and Personal Development revealed a weighted mean score of 57, which suggests less than good employee engagement and process demands, scores in this category suggest areas of weakness or developing weakness (Employee Engagement Survey Report, 2015). Overall, *Culture of Employee Engagement* received a rating of **Moderate** performance.

The two productivity variables identified to measure *Strengthening Performance Management*, namely, Performance Management and Process revealed a weighted mean score of 52. This score recognises instant alerts of vulnerabilities and shows the greatest gap in engagement, performance, attitudes and

behaviours (Employee Engagement Survey Report, 2015). *Strengthening Performance Management* received an overall rating of **Poor** performance.

Information derived from the UWI 2015 Employee Engagement Survey revealed that the overall weighted mean score compiled for EED was 55. **Employee Engagement and Development** received a rating of **Moderate** performance, which indicates less than good employee engagement and process demands; scores in this category suggest areas of weakness or developing weakness in productivity (Employee Engagement Survey Report, 2015).

Table 4.3: Employee Engagement and Development Survey Scores and Rating

THEME: Goal	Performance Variables	Factors	Score (2012)	Score (2015)	Rating (2015)
COMPETENCY BASED DEVELOPMENT: *Improve leadership and management capabilities and job competencies of all employees so that they can effectively fulfil their roles*	Visionary leadership	Good strategy; Job Knowledge; Communicated vision	56	57	Moderate
	Nature of Work	Safe work environment; sense of autonomy; relevant work	62	62	Moderate
	Line of Sight	Inspired vision; Goal clarity; accountability; I see the vision	46	47	Poor
CULTURE OF EMPLOYEE ENGAGEMENT: *Create an organisational environment that promotes personal growth and development for employees and positive cognitive, emotional and behavioural states directed toward optimum organisational outcomes*	Growth Opportunities	Bright future; Personal development; Training responsibility; Great place to work	61	60	Moderate
	Trust and Integrity	Integrity; Management care for me; Speak freely; Trust; Treated with integrity	53	53	Poor
	Personal Development	Ongoing performance feedback; learn and grow; Tools to do well	59	59	Moderate
STRENGTHENING PERFORMANCE MANAGEMENT SYSTEMS: *Improve, upgrade and align all HR Systems*	Performance Management	Goals are specific; Track goals; Correct problems	49	51	Poor
	Process	Modify processes; Processes are simple; Administration staff; Welcome after hiring	57*	54	Poor

Source: Adapted from the UWI Strategic Plan 2012-2017 and the UWI Employee Engagement Surveys conducted in 2012 and 2015.
Note: 54% and less = Poor; 55%-79% = Moderate and 80% and above = Good.
***This factor received a moderate score in 2012 compared to a Poor score in 2015.

4.5.2. Internal Operational Processes (Employee Feedback)

Internal Operational Processes can be defined as the "critical organisational activities and processes that impact on the quality of service that the UWI provides to its various stakeholders" (UWI Strategic Plan 2012, 31). Efficient and effective internal operational processes are fundamental to achieving the UWI key initiatives and goals. Operational productivity can help eliminate bottlenecks, redundancies, and unnecessary steps; and it can also prevent loss of resources, including capital assets, inventory,

proprietary information, and finances (University of Arizona 2007, 1). The feedback scores for the 2012 and 2015 employee engagement surveys remained relatively the same (see Table 4.4).

Table 4.4: Internal Operational Processes Survey Scores and Rating

THEME: Goal	Performance Variables	Factors	Score (2012)	Score (2015)	Rating (2015)
EFFICIENT AND EFFECTIVE ACADEMIC AND ADMINISTRATIVE PROCESSES: *Re-engineer academic and administrative operational processes and procedures to make them simpler, more transparent, efficient, and effective*	Technology	Technology for efficiency; Technology is reliable; IT meets needs	59	58	Moderate
	Process	Modify processes; Processes are simple; Administration staff; Welcome after hiring	57	59	Moderate
	Business Value	Ethical standards; Best lecturers; Well managed; Social responsibility	55	56	Moderate
GOVERNANCE ARRANGEMENTS: *Integrate improved governance systems into the UWI's operations*	Leadership Skills	Follows through on commitment; Values me; Guides me; Calm in conflict; Job well done; Seeks real solutions; Innovative steps; Respect for supervisor	62	63	Moderate
	Customer Focus	Proud of service; Track goals; correct problems	58	58	Moderate
	Immediate Supervisor	Clear vision; New approaches; Manager skills	62	63	Moderate
MANAGEMENT STRUCTURES: *Improve the effectiveness of executive and senior management structures at campus and university levels*	Innovation	Entrepreneurial spirit; Act on good ideas; deliver better education	54	53	Poor
	Communication	Helpful meeting monthly; Meet once a month; Information flows; Is inclusive; Aware of what is going on	58	58	Moderate
	Visionary Leadership	Good strategy; Know what to do; Communicated vision	56	57	Moderate

Source: Adapted from the UWI Strategic Plan 2012-2017 and the UWI Employee Engagement Surveys conducted in 2012 and 2015.
Note: 54% and less = Poor; 55%-79% = Moderate and 80% and above = Good.

The three productivity variables identified to measure *Efficient and Effective Academic and Administrative Processes*, namely, Technology, Process, and Business value revealed a weighted mean score of 57. This score indicates less than good employee engagement and process demands. Scores in this category suggest areas of weakness or developing weakness. The strategic theme, *Efficient and Effective Academic and Administrative Processes,* received a rating of **Moderate** performance.

For the strategic theme, Governance *Arrangements,* the performance variables namely, Leadership Skills, Customer Focus and Immediate Supervisor revealed a weighted mean score of 61. This score points to less than good employee engagement and process demands. Scores in this category suggest areas of weakness or developing weakness. *Governance Arrangements* received a rating of **Moderate** performance.

The three productivity variables identified to measure *Management Structures*, namely, Innovation, Communication and Visionary Leadership revealed a weighted mean score of 56. This score indicates less

than good employee engagement and process demands. Scores in this category suggest areas of weakness or developing weakness. Management Structures received a rating of **Moderate** performance.

Information derived from the UWI 2015 Employee Engagement Survey has revealed that the overall weighted mean score compiled for IOP was 58, this score indicates less than good employee engagement and process demands; scores in this category suggest areas of weakness or developing weakness. **Internal Operational Processes** received a rating of **Moderate** performance.

4.5.3. Internal Operational Processes Analysis (Undergraduate Student Satisfaction Survey)

The University provides a number of technical and administrative support services to its students, namely, information to support student application; user-friendliness of the online application system; efficiency of the registration process; the examination process and the handling and resolution of student matters. Data collected from the 2010 and 2013 Undergraduate Student Satisfaction Surveys (or SYM) were used to analyse technical and administrative services provided to students.

Box 4.2: About the Student Satisfaction and Experience Survey

The Undergraduate and Postgraduate Student Satisfaction and Experience surveys are integral parts of the continuous quality monitoring process undertaken by the University Office of Planning & Development (UOPD) on the four campuses of the UWI. The survey measures the experience of undergraduate and postgraduate students based on both academic and non-academic criteria.

One of the main objectives of these student surveys is to understand how satisfied the UWI students are with their university experiences, with a view to identify which educational experiences have been beneficial or deficient and on the basis of such information, to devise ways and means to serve them better.

Survey results and their subsequent action plans are used to help bring about improvements to both the management of academic and administrative services and their efficient delivery to students.

Several departments of the UWI are responsible for these student support services. These technical and administrative support services are provided by the Information Technology Support departments, the Library and Academic Advising Units on the respective Campuses. These services or factors were analysed under the three Performance Variables, namely, Technology, Process and Business Value *(see Table 4.5).*

Results from the 2010 and 2013 Undergraduate Student Satisfaction Surveys revealed that performance in the administrative processes provided by both IT Support Services and Library Services received a **Moderate** level of satisfaction, save and except, the factor of *user-friendliness of the online application system*, which received a strong level of satisfaction in the 2010 survey.

Table 4.5: Efficient and Effective Administrative Processes					
THEME: Goal	**Performance Variables**	**Factors**	**Score (2010)**	**Score (2013)**	**Rating (2013)**
EFFICIENT AND EFFECTIVE ACADEMIC AND ADMINISTRATIVE PROCESSES: *Re-engineer academic and administrative operational processes and procedures to make them simpler, more transparent, efficient, and effective to achieve optimal stakeholder satisfaction within and across campuses.*	Technology	User-friendliness of the online application system	3.73*	3.59	Moderate
		Efficiency of the registration process	3.35	3.18	Moderate
	Process	The examination process	3.47	3.43	Moderate
	Business Value	Information provided to support student application to UWI	No data	3.40	Moderate
		Handling and resolution of student matters	2.81	2.76	Poor
Overall Mean Score			3.34	3.30	Moderate

Source: Adapted from the UWI Strategic Plan 2012-2017, the UWI Employee Engagement Surveys 2012 and 2015 and the UWI Student Satisfaction and Experience Surveys conducted in 2010 and 2013.
Scores: 1.99 & less = weakest; 2.00-2.49 = low; 2.55-2.99 = less than; 3.00-3.49 = moderate; 3.50-3.99 = strong; 4 & above = very strong.
***This factor received a Strong level of satisfaction in the 2010 survey as compared to Moderate level of satisfaction (3.59) in the 2013 undergraduate student survey.

Undergraduate students gave these key elements of student administrative services a **Moderate** rating. Scores in this category suggest areas of weakness or developing weakness. Similar **Moderate** results were produced for the 2010 Undergraduate Student Satisfaction survey. The data have revealed that administrative services provided to undergraduate students have remained the same over the two survey periods. Consequently, critical administrative strategies and interventions are needed in the provision of student services at the UWI.

4.5.4. Internal Operational Processes Analysis (Postgraduate Student Satisfaction Survey)

A Postgraduate Student Satisfaction (PG-SES) Survey was conducted in 2013 and was focussed on the academic and non-academic experiences of postgraduate students. The main objectives of the survey were to identify key educational products and services influencing student satisfaction/dissatisfaction and provide recommendations that could inform actions, policies and procedures to improve levels of student satisfaction.

Support Services

Overall, both research and taught students found that support services were generally mediocre across the University and that support services were just about average. However, research respondents scored services and facilities a bit higher than taught postgraduates.

The overall level of Support Services on the Campuses were rated as moderate. Mona recorded a score of 3.04, Cave Hill 3.13, St Augustine 3.17 and Open Campus 3.21 in the taught programme. The research respondents rated support services at 2.53 at Mona, 3.01 at St Augustine, and 3.21 Cave Hill. Taught postgraduates across the campuses rated student financial support services as low and similarly, the quality of service at the Office of Student Services *(see Table 4.6)*.

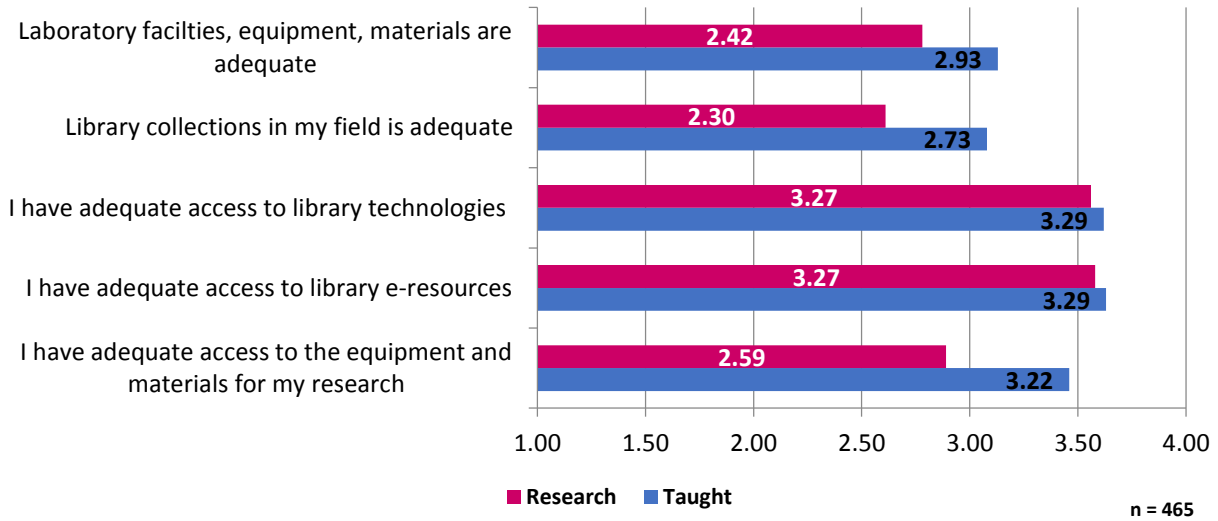
Table 4.6: Taught and Research Postgraduates Satisfaction with Support services by Campus								
CAMPUS (n-410)		**Departmental administrative support services**	**Student Portal**	**Health Services Unit**	**Student Financial Support**	**Technical support (e.g. laboratory technicians, computer technicians)**	**Student services of the Office/School of Graduate Studies and Research**	**Office of Student Services**
Taught	Cave Hill	3.29	3.49	3.44	2.59	3.07	3.27	2.77
	Open Campus	3.31	4.00	2.38	2.82	3.31	3.61	3.06
	Mona	3.05	3.29	3.36	2.35	3.33	2.98	2.93
	St Augustine	3.13	3.69	3.36	2.85	3.13	3.29	2.76
Research	Cave Hill	3.16	2.93	3.65	3.42	3.59	3.37	2.38
	Mona	2.65	2.94	2.81	2.71	2.58	2.00	2.00
	St Augustine	2.91	3.22	3.22	2.97	3.29	3.04	2.42

Note: Mean scores of 5.00 = definitely agree/very satisfied; 4.99-4.00 = mostly agree/satisfied; 3.99-3.00 = neither agree nor disagree/neither satisfied nor dissatisfied; 2.99-2.00 = mostly disagree/dissatisfied; 1.99-1.0 = definitely disagree/very dissatisfied
Source: PG-SES 2013.

Learning facilities

Both taught and research respondents found that the library collections in their disciplinary field and laboratory facilities, equipment, materials, chemicals were inadequate with mean scores ranging from 2.03 to 3.07 for library collection and 2.63 to 3.25 for laboratory facilities. Campuses performed more favourably in areas related to access to library e-resources and library technologies.

Figure 4.1: Experience with use of learning resources and facilities (mean scores)



Note: Mean scores of 5.00 = definitely agree/very satisfied; 4.99-4.00 = mostly agree/satisfied; 3.99-3.00 = neither agree nor disagree/neither satisfied nor dissatisfied; 2.99-2.00 = mostly disagree/dissatisfied; 1.99-1.0 = definitely disagree/very dissatisfied.
Source: PG-SES 2013.

Campuses were assessed in relation to support services and it was found that these services were rated at the low end of moderate overall. Learning resources and facilities were seen as adequate by taught

postgraduates however, research respondents found them just below average. Respondents agreed that library collections in their disciplinary field and laboratory facilities, equipment, materials, chemicals were inadequate (PG-SES, 2013).

Overall, support services were generally seen by postgraduate students as mediocre across the University. Experience of the quality of service at the Office of Student Services was seen as moderate across the campuses (PG-SES, 2013).

4.6. The *UWI Strategic Plan 2012-2017*

Even though information derived from the undergraduate and postgraduate student surveys revealed a moderate level of satisfaction with University administrative services, the UWI has however made incremental improvement over the past four years (2012-2016) with the completion of key student services initiatives.

With specific regards to the Perspectives of EED and IOP, there were several administrative services initiatives which contributed to the overall strategic goal achievement of the *UWI Strategic Plan 2012-2017*. An analysis of the strategic objectives-to-strategic initiatives was undertaken, and the following completed service initiatives were identified from Campus/Vice Chancellery reports submitted in March, 2016.

4.6.1. Employee Engagement and Development

Reports submitted by the Campuses and units in the Vice Chancellery revealed that 38 per cent of the 77 initiatives were at some degree of completion *(see Table 4.7)*.

Table 4.7: Status of Campus-level Initiatives by Perspectives (%)

PERSPECTIVES	Status	Cave Hill		Mona		Open Campus		St Augustine		Vice Chancellery		TOTAL UNIVERSITY	
		No	%	No	%	No	%	No	%	No	%	No	%
Employee Engagement and Development	**Total**	**38**	**100%**	**3**	**100%**	**5**	**100%**	**23**	**100%**	**8**	**100%**	**77**	**100%**
	Completed	15	39%	0	0%	1	20%	12	52%	1	13%	29	38%
	On Schedule	10	26%	1	33%	0	0%	7	30%	1	13%	19	2%
	Incomplete	11	29%	2	67%	2	40%	0	0%	3	38%	18	24%
	Not Started	2	5%	0	0%	2	40%	4	17%	2	25%	10	13%
	Terminated/ Not Reported	0	0%	0	0%	0	0%	0	0%	1	13%	1	1%
Internal Operational Processes	**Total**	**24**	**100%**	**3**	**100%**	**7**	**100%**	**27**	**100%**	**12**	**100%**	**73**	**100%**
	Completed	10	42%	0	0%	0	0%	2	7%	2	17%	14	19%
	On Schedule	3	13%	2	67%	3	43%	11	41%	3	25%	22	30%
	Incomplete	5	21%	0	0%	1	14%	9	33%	2	17%	17	23%
	Not Started	3	13%	0	0%	3	43%	5	19%	2	17%	13	17%
	Terminated/ Not Reported	3	13%	1	33%	0	0%	0	0%	3	25%	7	10%

Some key completed initiatives were as follows:

- Annual management and leadership workshop for new Deans and Heads of Departments (Cave Hill)
- Develop Emergency Evacuation procedures for campus buildings (Cave Hill)

- Vigorous promotion of Occupational, Environmental Health and Safety and Security in the Workplace (Cave Hill)
- Use competencies as the basis for succession planning (St Augustine)
- Train staff in Leadership Challenge Model (Open Campus)
- Conduct frequent collaborative, non-crisis meetings with the Unions on matters of mutual interest (St Augustine)
- Promotion of a high level of participation in the employee engagement survey and feedback to employees, once results are available–2014/2015
- Implement a revised Orientation/On-boarding process (Open Campus)
- Redesign and refurbish staff work areas to enhance employee comfort and well-being (St Augustine-Library)
- Audit existing processes and workflows to improve efficiency in all library operating processes (St Augustine)
- Adopt project management methodologies (Vice Chancellery –University Chief Information Officer).

3.6.2. Internal Operational Processes

According to Reports submitted by the Campuses and units in the Vice Chancellery there were 73 initiatives of which 19 per cent were at some degree of completion *(see Table 4.7*. Some key completed initiatives were as follows:

- Revise roles and responsibilities of Deputy Deans and Curriculum administrators (Cave Hill)
- Implement/monitor service excellence standards compliance and performance by non-academic units (St Augustine)
- Staff Express Forum (St Augustine)
- Conduct Graduate Tracer surveys and Student Experience Surveys (St Augustine)
- Develop an interactive web interface on the UOPD Website for stakeholder feedback (VC- UOPD)
- General ICT Infrastructure Upgrade Project (Open Campus)
- Commencement of the Open Campus Enterprise Resource Planning (ERP) Implementation project (Open Campus)
- Establish the Open Campus ICT Steering Committees in accordance with the UWI ICT Governance Structure (Open Campus)
- Develop a Business Continuity and Disaster Recovery Plan (Open Campus)
- The approval and implementation of a UWI Cave Hill Campus Student Charter (replaced the initiative to implement a Campus Quality Policy (Cave Hill)
- The Campus' IT Services have been strengthened with the transfer of some IT Services to Data Centre (Cave Hill)
- significant gains in information, communications and technology (ICT) and library systems (Vice Chancellery)
- Completion of Thesis Tracker and engagement of OGS&R on each campus to implement (Vice Chancellery).

3.7. Conclusion and Recommendations

According to Cameron (1978, 7), higher education research in administrative productivity and performance has shown that it is considerably challenging and even difficult to assess institutional effectiveness, as there is no one ultimate performance model of performance that can be applied as a best practice. However, the UWI has made significant efforts in their *Strategic Plan 2012-2017* to identify KPIs which can be used to enhance general administrative efficiencies in staff and student services. Moreover, the strategic goal achievement of the University's *Strategic Plan 2012-2017* will be the defining characteristic of institutional effectiveness.

However, the results of this performance analysis into administrative services have revealed that there is less than good employee engagement and process demands in the UWI and that the performance scores

in the two BSC Perspectives of EED and IOP suggest areas of weakness or developing weakness in overall performances.

The results of the 2012 and 2015 Employee Engagement surveys were virtually the same with an approximate 30 per cent response rate (Labovitz, 2015, 5). The three major categories: (i) emotional drivers (ii) rational drivers; and (iii) operational excellence scored exactly the same without variation and basically showed no improvements in the three major categories. Consequently, a university-wide policy framework for improved performance and continuous improvement is urgently required, with the main objective being the identification of the possible causes that affect the efficient delivery of quality services to staff and students. The need for further improvement and greater efficiency in staff and student services are critical success factors for the UWI to become regionally and internationally competitive and committed in serving its main stakeholder, the student (SYM 2013). This framework must be developed to ensure greater efficiencies in the administrative and operational management of the UWI.

The present economic decline facing the Caribbean will have a significant impact on the strategic mandate and overall delivery of education for the UWI in the future. Many HEIs and systems which seek to meet increasing demands while maintaining the quality of education in a resource constrained environment are being forced to consider two basic strategies, specifically, (i) generate additional revenue; and (ii) increase productivity (Gates and Stone 1997, 2).

According to Gates and Stone (1997, 6), the general approach taken by several universities is to develop performance measures on key indicators for both efficiency and effectiveness, and then to use these measures together in order to monitor productivity improvement. There is evidence that these administrative metrics and indicators are already documented in the *UWI Strategic Plan 2012-2017* and will therefore have to be further tweaked going forward into the preparation of the new *UWI Strategic Plan 2017-2022*. The UWI administrative services goals and strategies, delineated in the existing *Strategic Plan*, should be wholly adopted, with the main objective to transform and modernise the total quality management of University operations, which will improve the quality of educational services to all of its stakeholders.

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CHAPTER FIVE: TEACHING AND LEARNING PRODUCTIVITY AND PERFORMANCE MEASURES

Teaching, Learning and Student Development is the core business of the UWI and will always be a priority item. The *Teaching, Learning and Student Development* Perspective focuses on enhancing academic quality to support the development of the seven key attributes of the UWI graduate. This Perspective also involves improving the total student experience, and open and distance education services. Table 5.1 shows the various productivity and performance measures used to evaluate productivity improvements in this Perspective.

Table 5.1: Teaching, Learning and Student Development

Strategic Theme	Productivity Measures	Classification
Enhance Student Engagement and Experience	• Student satisfaction Scores - Non-Academic Services	Effectiveness
Graduate Prospect - Enhance employability of graduates	• Graduate employment by Campus, Faculty • Underemployment rate by Faculty • Graduate satisfaction with attributes	Effectiveness
Enhance access via Open & Distance Education	• Open campus enrolment as percentage of total UWI enrolment	Effectiveness
Faculty productivity – teaching loads	Average teaching workload (weekly hours) per FT Academic Staff	Efficiency
Efficiency in the Teaching function - Throughput	• First Year Retention rates • Attrition Rates • Overall Graduation Rate • On time graduation rate • Average Time to graduate	Efficiency
Improve teaching efficiency/quality	Staff-student ratios	Effectiveness

5.1. Measuring productivity at the UWI: *Teaching, Learning and Student Development* Perspective

This section will look at productivity improvements based on the various strategic themes outlined in Table 5.1.

5.1.1. Strategic Theme: Enhance Academic Quality

Enhancing academic quality involves, among other things, improving quality assurance practices; increasing accredited undergraduate and postgraduate programmes; promoting continuous curriculum renewal; and competency-based activities linked to the attributes of the UWI graduate, the needs of the workplace and society, and recruiting and retaining high-quality staff and students.

Productivity/Performance Measure – Student satisfaction scores with Academic Quality and Academic Related Services

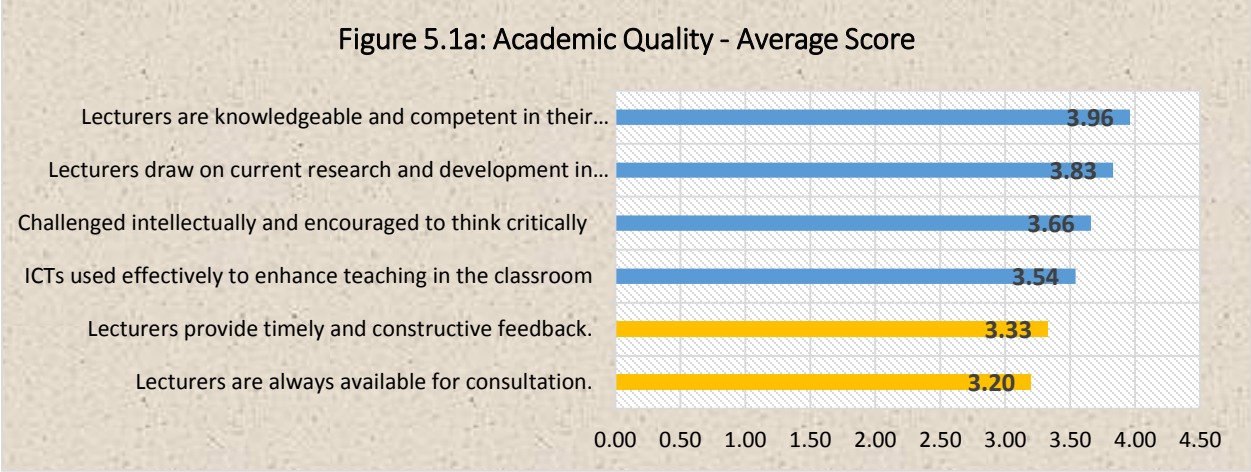
Student satisfaction is measure of student views of the teaching quality and experience at the university. It measures the experience of students based on both academic and non-academic criteria. A student satisfaction survey is usually the tool used to measure and ascertain whether the University is achieving its strategic objectives in specific areas. It should be noted that this type of survey is only a measure of student opinion and not a direct measure of quality so it may be influenced by a variety of biases, such as

the effect of prior expectations. For example, a top-notch university which is expected to deliver really excellent teaching could score lower than a less good university because of prior expectations.

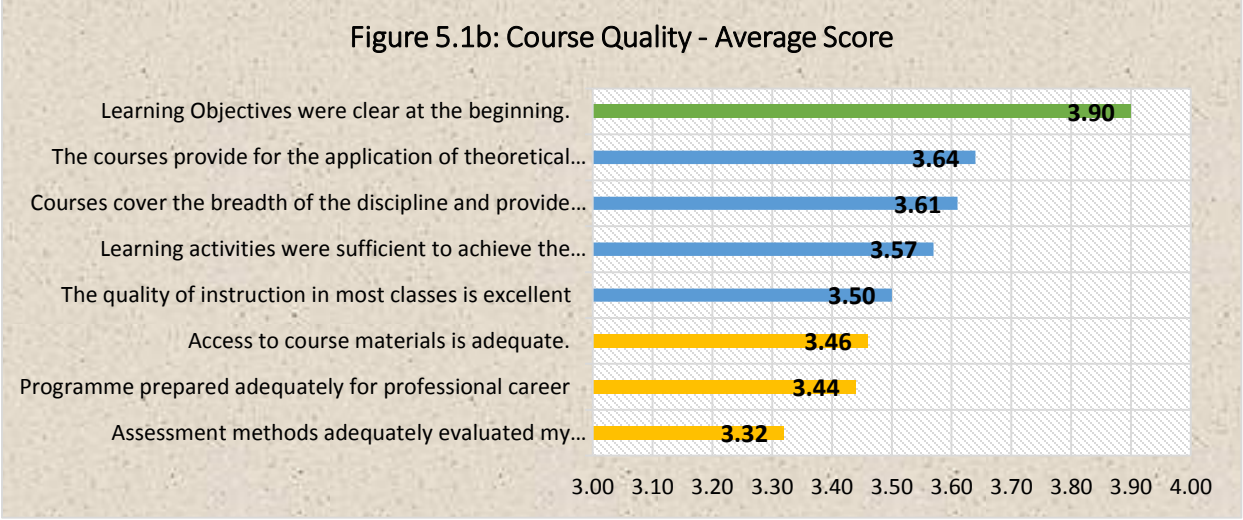
This section focuses primarily on data from the most recent undergraduate *Student Experience Survey - Speak Your Mind (SYM 2013) Report* which provided findings of the undergraduate student experience on the four campuses of the UWI. For the purposes of this exercise, the following ratings were used.

Rating	Score intervals	Comments
Very Satisfied	4 and Over	Positive ratings – on track
Satisfied	3.5 to 3.99	Significant progress but still room for improvement
Moderately Satisfied	3 to 3.49	Satisfactory but needs improvement
Unsatisfied	Less than 3	Problematic, needs to be addressed urgently

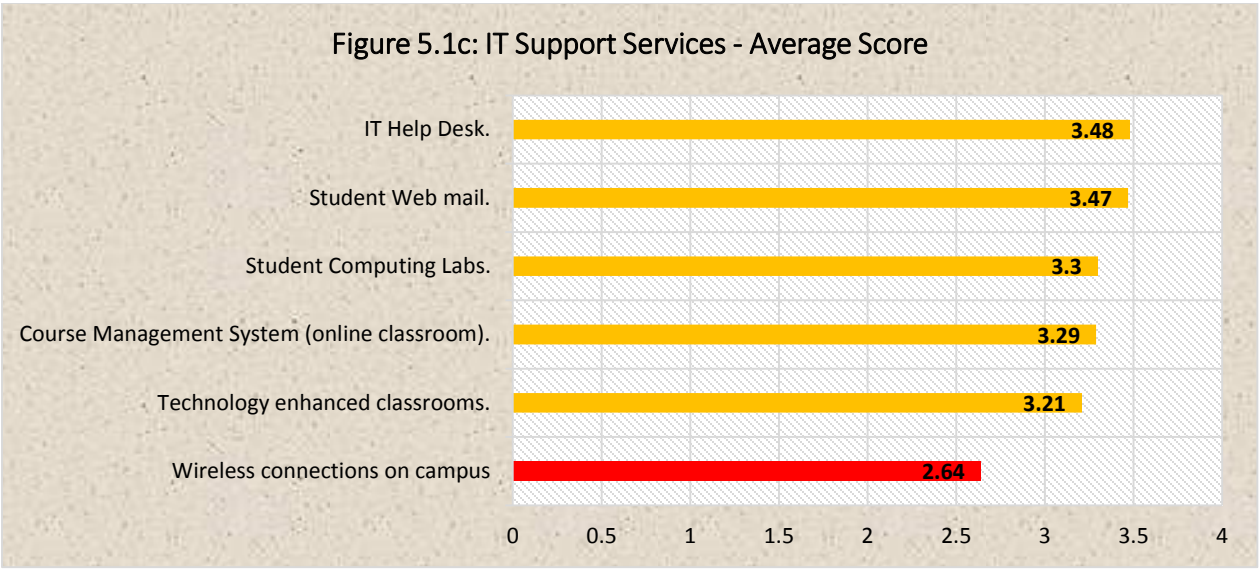
Generally, students were satisfied with teaching quality *(see Figure 5.1a)* and course quality *(see Figure 5.1b)* and moderately satisfied with IT *(see Figure 5.1c)* and library services *(see Figure 5.1d)*. However, they were not satisfied with academic advising *(see Figure 5.1e),* timely feedback from lecturers and availability of lecturers for consulting.



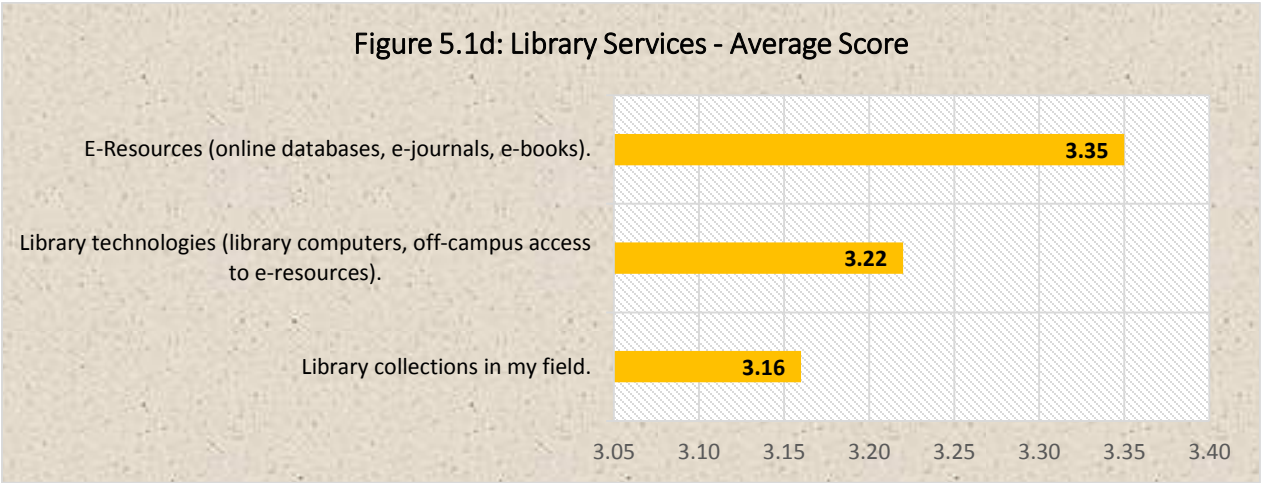
Source: UWI. Student Experience Survey Speak Your Mind. 2013.



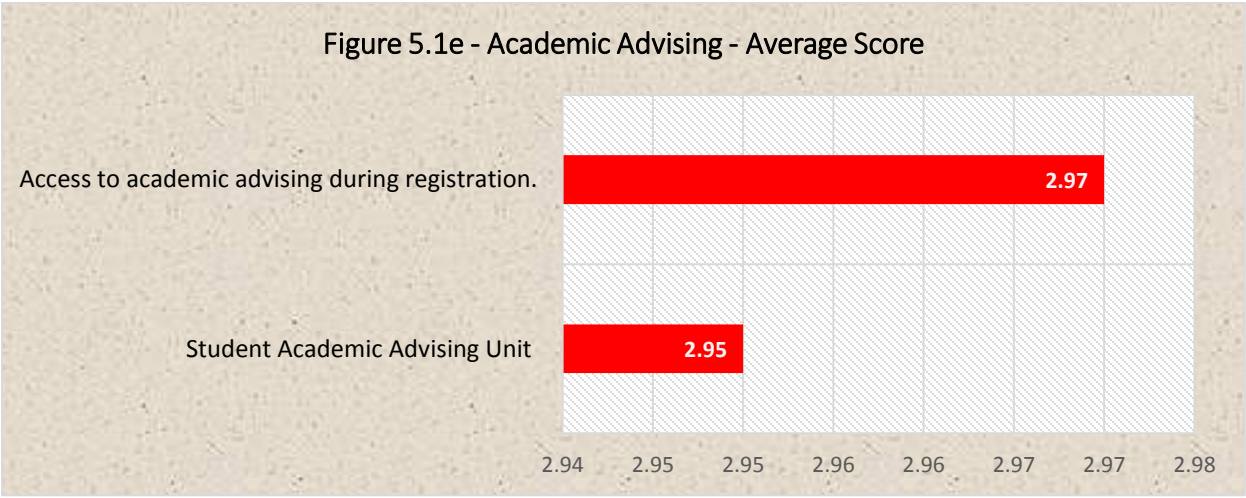
Source: UWI. Student Experience Survey Speak Your Mind. 2013.



Source: UWI. Student Experience Survey Speak Your Mind. 2013.



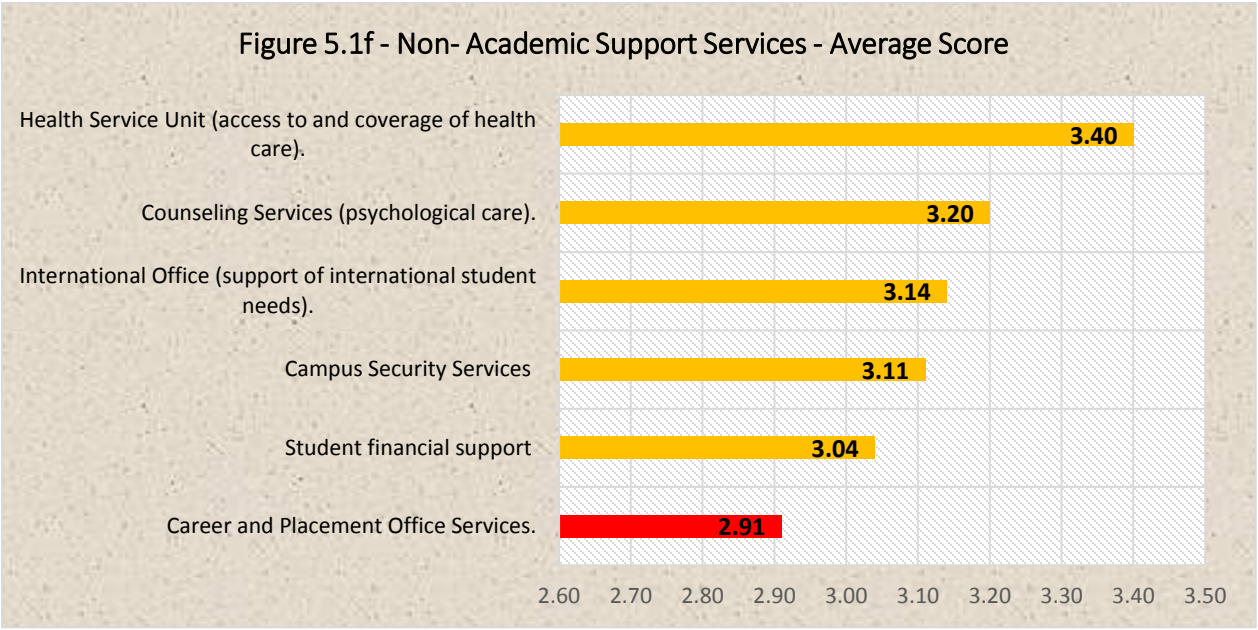
Source: UWI. Student Experience Survey Speak Your Mind. 2013.



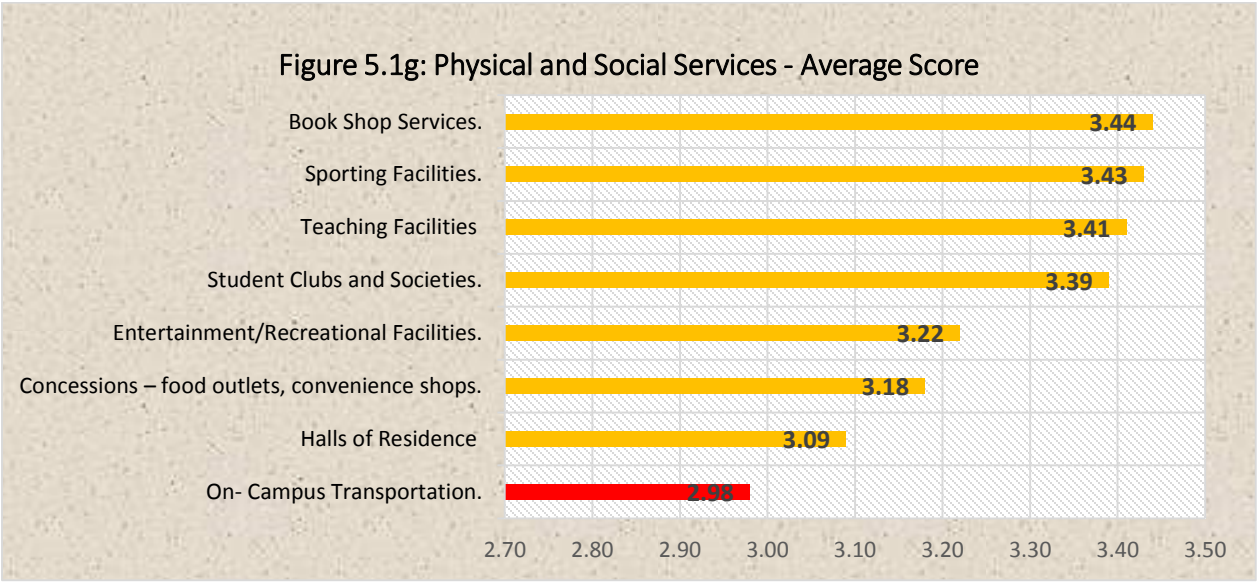
Source: UWI. Student Experience Survey Speak Your Mind. 2013.

Productivity Measure – Student satisfaction scores in Non-academic services

In terms of non-academic services and physical and social services, students were moderately satisfied. A particular area of concern is Career and Placement Office Services which is a key area in terms of the overall student experience *(see Figure 5.1f)*. Students were also not satisfied with on-campus transportation *(see Figure 5.1g)*.



Source: UWI. Student Experience Survey Speak Your Mind. 2013.



Source: UWI. Student Experience Survey Speak Your Mind. 2013.

Whilst students were generally satisfied with most areas in teaching and course quality, they were less satisfied with academic support, particularly academic advising and access to lecturers, suggesting that productivity of academic staff in this area is lacking. A number of factors may be responsible for this result including high staff workload, lack of policy and, large class sizes. The overall student experience needs to

be enhanced by improving non-academic, social and physical services, in particular, health services, career guidance and placement, security, recreational facilities and transport.

A number of initiatives have been implemented at the various campuses. The following are some examples:

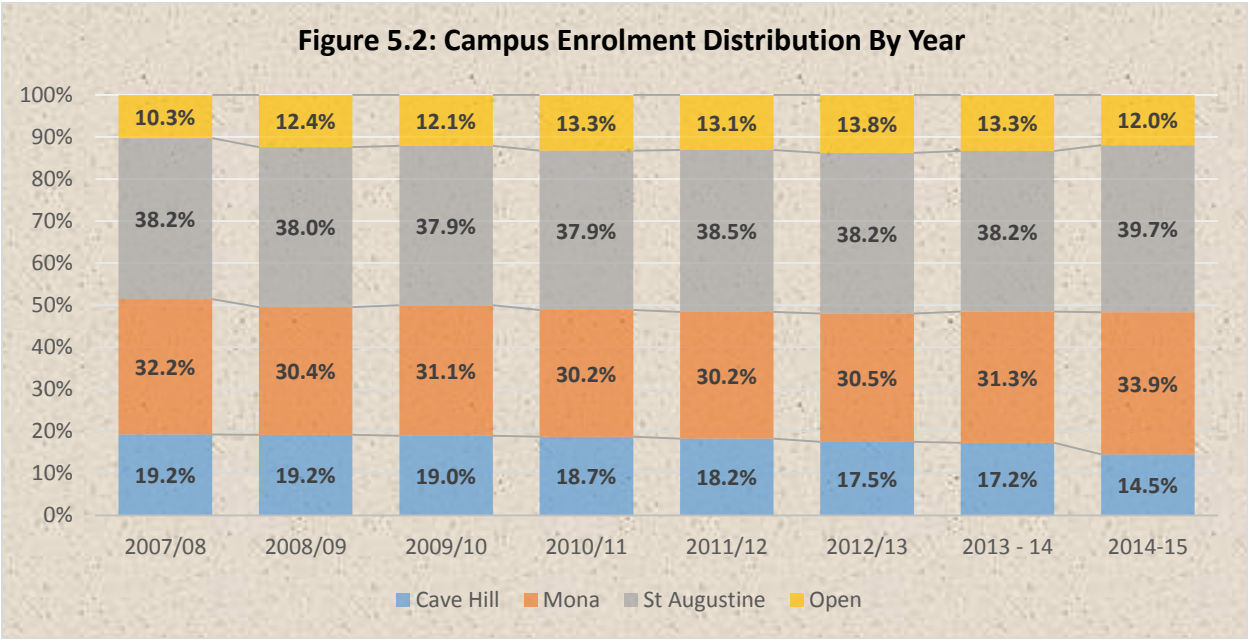
- Creation of an Office of Community Engagement and Service Learning (St Augustine)
- Introduction of new division of Student Services (St Augustine)
- Customer service training for all student workers. In addition, training in various areas of need was also directed to Student Leaders and Orientation Facilitators (that is, persons associated with orientation activities for first year students) (Mona)
- Review, update and strengthen existing guidelines for Staff-Student Liaison Committees. Responsibility (St Augustine)
- Review and streamline policies and procedures for treating with students with mental health challenges; Design service levels for Persons with Disabilities (PWDs) based on approved Policy; establish a referral and records management system for PWD (Cave Hill).

5.1.2. Strategic Theme: Open and Distance education - Enhancing access and diversity

According to the *Strategic Plan 2012-2017* (34), this strategic theme is premised on the expansion of programmes available for full online delivery will increase enrolment in catchment areas and provide a platform for the global market. As such, it will not only enhance access, but also increase diversity of student population by providing access to disadvantaged populations.

Productivity/Performance measure – Expand Distance Learning Opportunities – Open Campus enrolment as % of Total UWI Enrolment

Expanding distance learning opportunities is measured by taking Open Campus enrolment as a percentage of total UWI enrolment. Figure 5.2 shows that the Open Campus enrolment as a percentage of total enrolment has been fairly stagnant and has even declined within recent times, falling from 13.3 per cent in 2013/2014 to 12.0 per cent in 2014/2015. It should also be noted that there are also a number of distance/online programmes offered at the Mona Campus with 416 students enrolled in 2014/2015 compared to 459 in the previous year.



The recent trend of declining enrolment in distance programmes needs to be reversed. The Open Campus needs to expand its offerings, not only at the undergraduate level but, at the postgraduate and the continuing professional education levels where there is a large captive market.

5.1.3. Strategic Theme: Academic Quality – Graduate Prospects - enhance the employability of graduates

One of the main indicators in assessing the impact or success of a University education is the ability of graduates to find meaningful employment. University education is an important investment that helps people build their skills and prepare for high-skilled jobs.

Graduate prospect measures of the employability of a university's first degree graduates by measuring the following: (i) employment rates; (ii) levels of underemployment, and (iii) feedback on development of attributes.

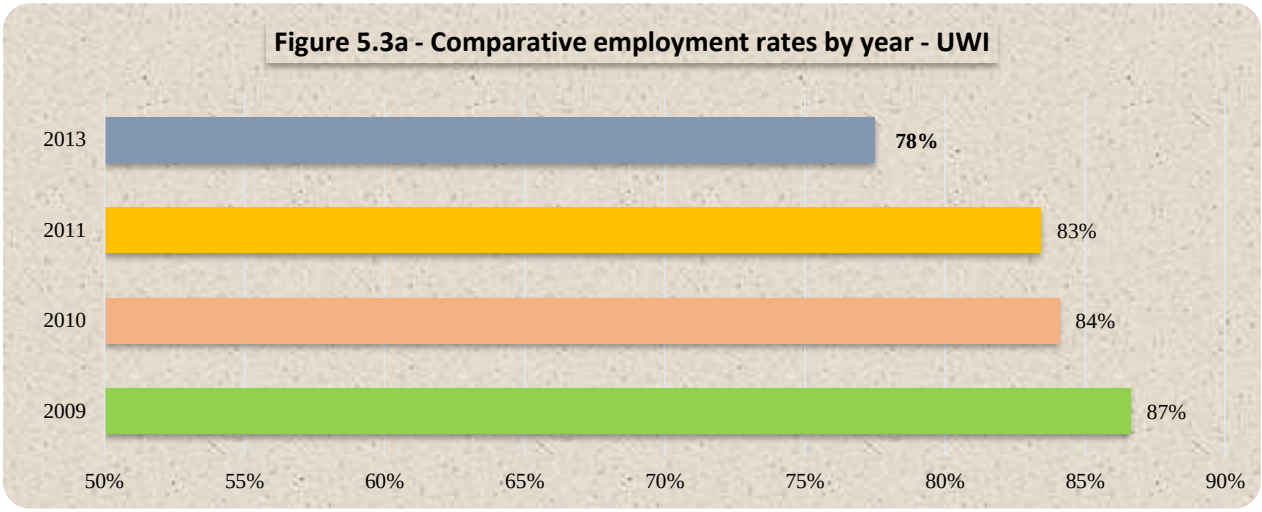
Productivity/Performance Indicator -Employment rate

For this purpose, employment rate is the number of graduates who take up employment one year after graduation with a known destination expressed as a percentage of the total number of graduates in that particular cohort.

A look at overall employment rates for the UWI graduates between 2009 and 2013 as shown in Figure 5.3a reveals that while the majority of graduates find employment at least one year after graduation, there are still large numbers of unemployed graduates. Time series data suggest that there is a trend of decreasing employment rates moving from an overall rate of 87 per cent in 2009 to 78 per cent in 2013.

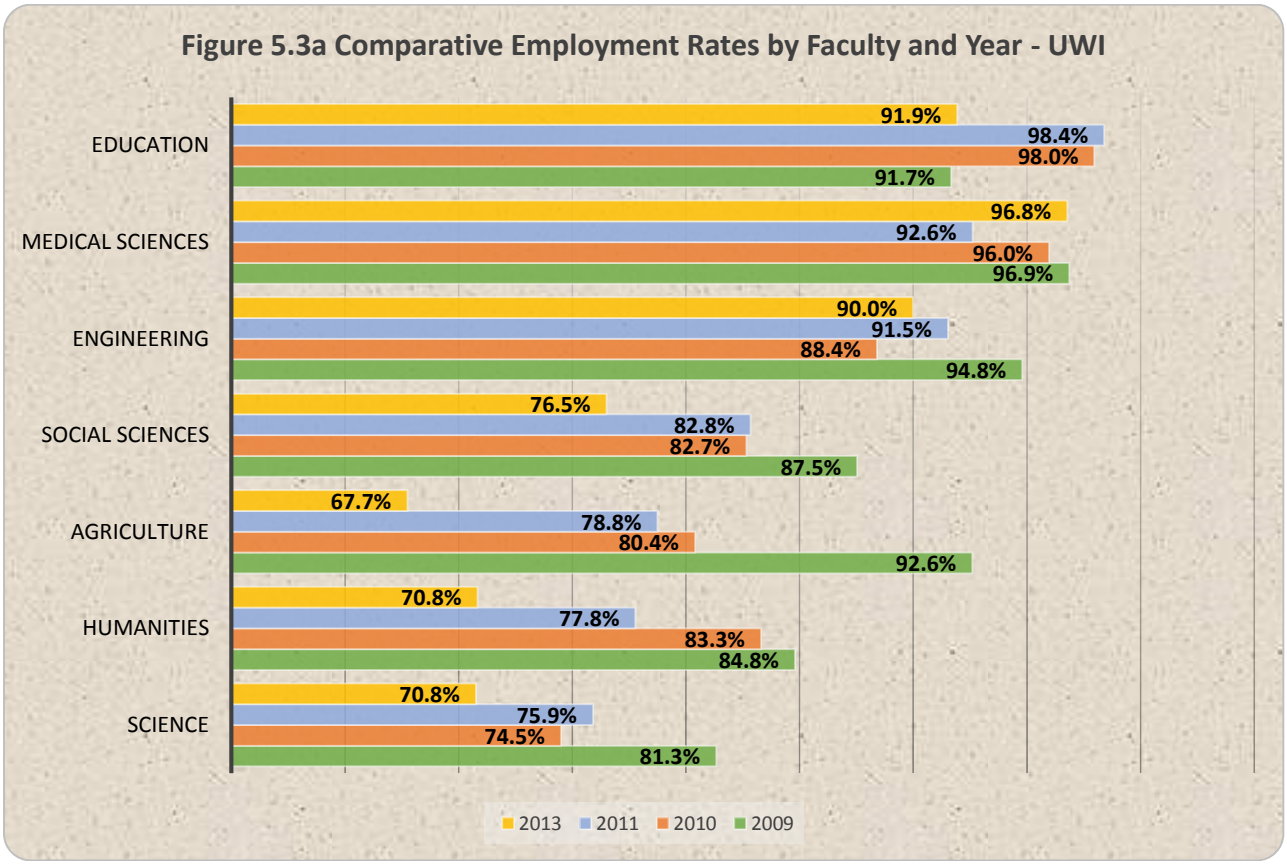
This can be attributed to a certain extent to the effects of the global economic downturn, which began in the last quarter of 2008, and which have taken a toll on graduate employment, particularly for graduates of Mona and Cave Hill Campuses. Other factors would include a mismatch between demand and supply in specific areas as well as employability skills of graduates. It should also be noted that more graduates have opted to further studies moving from 22 per cent in 2009 to 38 per cent in 2013, some of which may be as result of lack of employment opportunities.

Figure 5.3a - Comparative employment rates by year - UWI



Source: UWI. "Report on Recent UWI First Degree Graduate Experience Beyond Graduation – A Comparative Analysis of Four Tracer Surveys Conducted in 2009, 2010, 2011 and 2013 For UWI Campuses." August 2015.

At the Faculty level *(see Figure 5.3b),* there was a clear pattern across campuses showing above average employment rates each year for Education, Medical Sciences and Engineering (mainly professional programmes), while in Figure 5.3b average employment rates were observed for graduates from Agriculture, Science, Humanities and Social Sciences across campuses. A worrisome trend of declining employment rates is also evident for these aforementioned faculties.



Source: UWI. "Report on Recent UWI First Degree Graduate Experience Beyond Graduation – A Comparative Analysis of Four Tracer Surveys Conducted in 2009, 2010, 2011 and 2013 For UWI Campuses." August 2015.

Many graduates, particularly from Social Sciences, Science and Technology and Humanities were more likely to be unemployed, underemployed and say that their degrees were not related to their current jobs and their skills not being fully utilised. While many aspects of the results of the survey speak positively about education at the University, the data do reveal some troubling aspects of the graduates' experiences beyond university which are worthy of further and closer examination. Of particular concern is whether the relatively high and seemingly increasing unemployment levels of graduates are a temporary blip as a result of hard economic times or is it a recurring oversupply of graduates resulting from a mismatch between demand and supply of graduates or is it a mismatch between graduate skills and employer needs.

There are questions about the effectiveness of UWI in providing skills for the market in terms of the employability and generic skills of graduates. An assessment of the results of the surveys will indicate that there is a need for the University to continue to enhance the employability skills/attributes of students which is a necessary ingredient in transforming the skilled workforce to be more innovative and entrepreneurial among other things that are critical to social and economic transformation.

Productivity/Performance Indicator: Underemployment rate

Underemployment among graduates is a condition where graduates work in jobs that typically do not require a Bachelor's degree. The underemployment rate can thus be considered as the percentage of graduates who want full-time jobs commensurate with their qualifications but have had to settle for far less.

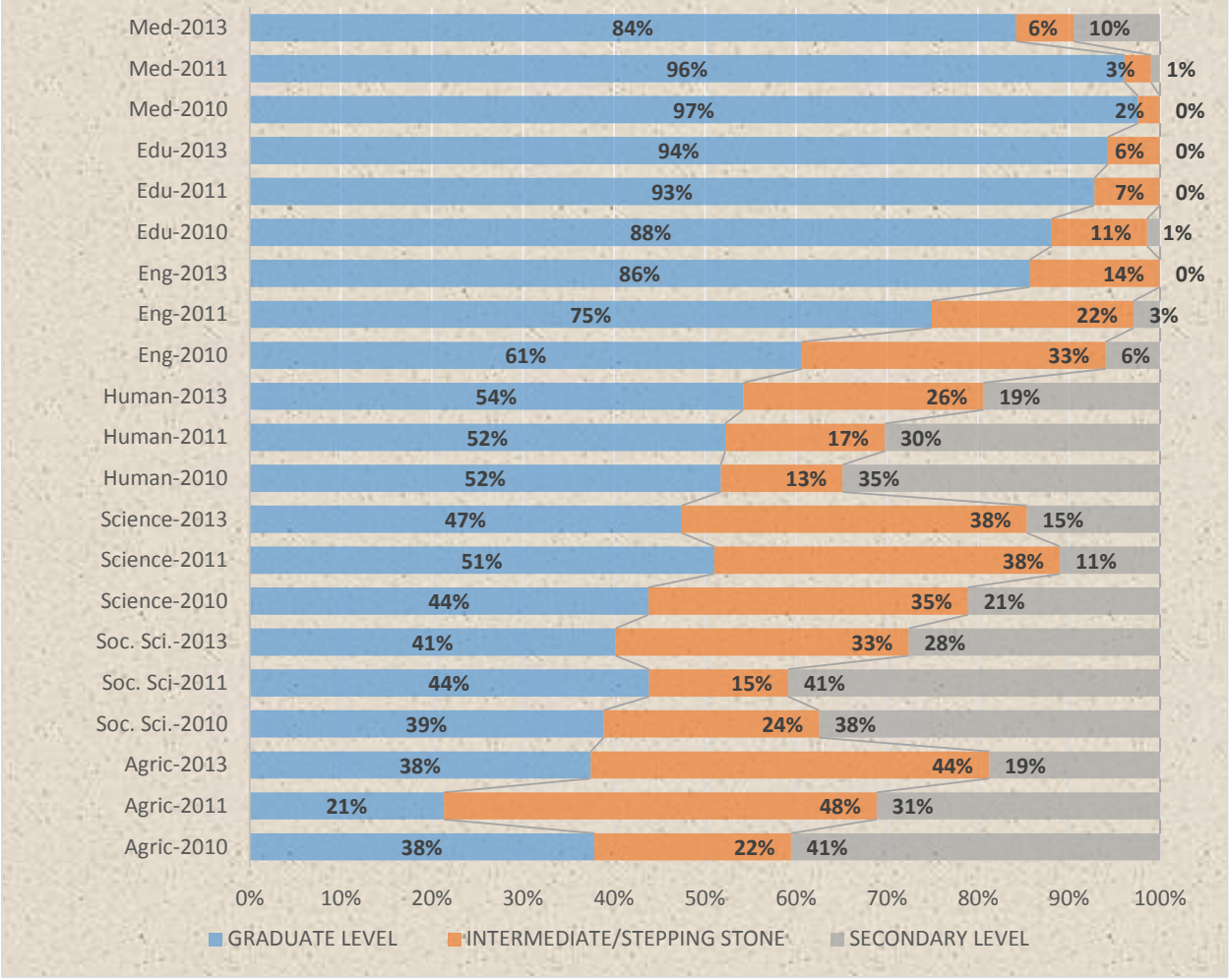
For the purposes of this exercise, jobs reported by graduates were classified into three main levels to determine and rank the percentage of graduates employed in jobs commensurate with qualifications.

a. **Level 1- Graduate level skilled jobs:** comprise (i) Professionals and (ii) Managers. These jobs usually require a minimum of a University First Degree for entry.
b. **Level 2 - intermediate jobs or "stepping stone" jobs**: comprise (i) Technicians and Associate professionals and (ii) Supervisors. These jobs usually require tertiary level vocational/technical training/associate degrees. In many instances employers may employ graduates with first degrees because of the competitive nature of the jobs market within recent times. Many university graduates use these jobs as a stepping stone to professional or managerial jobs. (this category excludes graduate trainee positions that are strictly for university first degree graduates)
c. **Level 3 - lower level jobs** (underemployment): comprise (i) Clerical workers, (ii) Service and Sales workers, (iii) Protective Services, and (iv) Other unskilled. For these jobs the entry level is a minimum of a secondary level education or even less.

As shown in Figure 5.4 graduates with a degree in Medicine, Education or Engineering were more likely to be employed as professionals and managers. Graduates employed in secondary level jobs were more prominent in Social Sciences, Humanities and Education, while graduates employed in intermediate jobs were more noticeable in the Science and Technology, Agriculture and Social Sciences.

Whilst a fair amount of underemployment is not uncommon for young people just after they obtain their degrees (a pattern which arises because graduates generally require some time to transition into the labour market), it is clear that graduates are emerging into a hugely competitive job market where they may wait years before securing meaningful employment. Many young university leavers who have spent at least three years studying are likely to build up large debts. It is no coincidence that areas with high unemployment rates/low employment rates such as Agriculture, Science and Technology, Social Sciences and Humanities also have higher underemployment rates. This once more reinforces that issue of supply and demand as well as relevance and marketability of programmes.

Figure 5.4: Broad job classification of reported graduate jobs by Faculty, 2010 -2013



Source: UWI. "Report on Recent UWI First Degree Graduate Experience Beyond Graduation – A Comparative Analysis of Four Tracer Surveys Conducted in 2009, 2010, 2011 and 2013 For UWI Campuses." August 2015.

Productivity Indicator: Employability – Development of key attributes

It is now universally accepted that University graduates need to possess critical employability skills and attributes to address the needs of 21st century development. Employers are now placing greater emphasis on employability skills as opposed to only academic/occupational knowledge associated with the graduate degree. The key attributes of the UWI graduate, both undergraduate and postgraduate, refer to those academic abilities, transferable skills, personal and professional qualities that should be acquired by students during their time at the University, regardless of their discipline of study. These qualities, should together with their academic/occupational knowledge enable a work-ready graduate.

These qualities will develop as a result of interaction with lecturers, other staff members, peers and the general community along with their personal and professional experiences. Developing these qualities enables all graduates to take on positive roles in society, and strengthens the region's intellectual and social capacities to explore new horizons in the interest of Caribbean development.

As indicated in the *UWI Strategic Plan 2012-2017,* a distinctive UWI graduate should demonstrate that he/she is:

i. A critical and creative thinker
ii. An effective communicator with good interpersonal skills
iii. IT-skilled and information literate
iv. Innovative and entrepreneurial
v. Globally aware and well-grounded in his/her regional identity
vi. Socially, culturally and environmentally responsible
vii. Guided by strong ethical values.

In order to gauge how well the University is doing in this area, graduates were asked to rate the extent to which their UWI education contributed towards each of the seven attributes necessary for their personal and professional development. Respondents were asked to rate on a scale of 1 to 5 (low to high) UWI's contribution to seven attributes reflective of the ideal UWI graduate. The response scale was as follows: *1=Very Little, 2= Little, 3=Moderate, 4=Strong* and *5=Very Strong.*

As shown in Figure 5.5, low ratings were given to 'Innovative and Entrepreneurial Skills' and 'Information Technology Skills' suggesting these were problematic areas. Greater focus, therefore, needs to be placed in strengthening these skills since creating wealth and developing innovation for a knowledge based economy requires a skilled labour force with these key attributes.

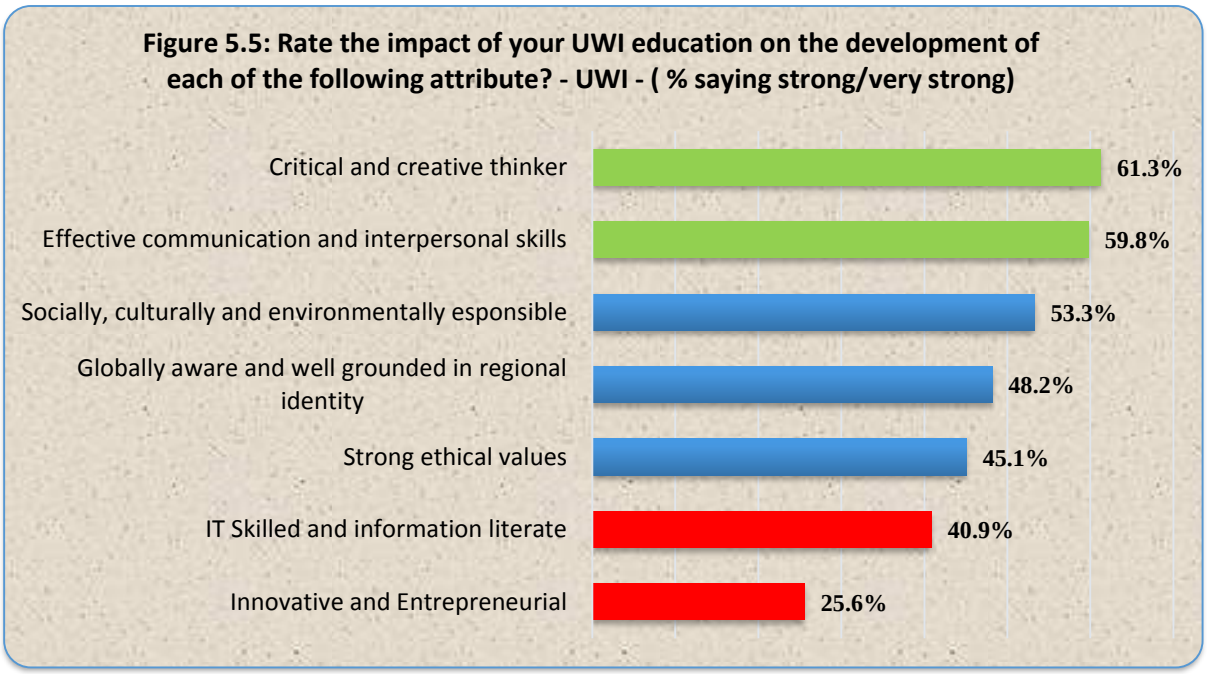
Graduates feel that their entrepreneurial and innovative skills were not sufficiently developed. Being 'Innovative and Entrepreneurial' is one of the key attributes a UWI graduate should possess. There is a need to create an innovative and entrepreneurial culture that would enhance the levels of self-employment and stimulate economic activity. This can be done by the University:

- Continuing to develop courses, programmes and initiatives that help develop students into innovative, entrepreneurial thinkers and global citizens; and
- Lobbying governments and private sector businesses to remove barriers and provide incentives for graduates to start up their own business.

Graduates also feel that their IT and Information skills were not sufficiently developed. There is a need to close the Technology gap in teaching, learning and research by:

- Continuing to develop courses, programmes and initiatives that help develop students IT and Information skills; and
- Examining ways to integrate tools such as the social networking phenomena, virtual reality websites, enhancing mobile learning (M-learning) and online video repository and delivery websites to further enhance the learning experience and improve productivity through flexible learning environments.

(*See Chapter Six for a discussion on the Ideal Graduate Attributes at the undergraduate and postgraduate levels and from the perspective of the Employers).*



Source: UWI. "Report on Recent UWI First Degree Graduate Experience Beyond Graduation – A Comparative Analysis of Four Tracer Surveys Conducted in 2009, 2010, 2011 and 2013 For UWI Campuses." August 2015.

5.1.4. Strategic Theme: Efficiency in the Teaching Function - Analysis of Throughput

It is apparent that more attention is being given internationally to throughput rates as one of the indicators of institutional effectiveness. Moreover, in North America, and increasingly in the United Kingdom, graduation rate information is being used in marketing HEIs in competitive environments. Also international ranking agencies such as UMR and THE/Thompson Reuters are using graduation rates to measure university performance.

At the UWI, internal stakeholders are now required to produce throughput information as a KPIs to measure the effectiveness of strategies to improve student progression and retention as well as time to graduate for undergraduate degrees and taught masters and research degrees as outlined in *Strategic Plan 2012-2017*. External stakeholders, particularly contributing governments, are now requesting throughput data to monitor and ensure that there is no wastage of public funding through slow or lack of progress of students in programmes funded by governments e.g. GATE (Government Assistance for Tuition Expenses) programme in Trinidad and Tobago.[11] Also, accreditation bodies are requesting throughput data as part of the review process.

Productivity Indicator: Throughput rates

This section uses the data and results from the most recent known throughput study available, *Undergraduate and Postgraduate Throughput for the Cohort of 2006,* produced by the St Augustine Campus Office of Planning and Institutional Research (COPIR) in September 2015.

This study was undertaken using administrative data extracted from the St Augustine Campus Business Intelligence (BI) system which integrates data from the Banner Enterprise System into a central data repository and allows real-time access to student data and information. This system permitted the COPIR

[11] The Government Assistance for Tuition Expenses (GATE) programme provides financial assistance to citizens of Trinidad and Tobago, who are pursuing GATE-approved tertiary level programmes at local and regional public and private Tertiary Level Institutions (TLIs).

to extract historical academic records of newly admitted students for 2006/2007 to facilitate throughput analysis.

Some key dimensions of academic progression that were analysed in the intake cohort framework were:

i. **Overall Graduation Rate**: the cumulative proportion of students in each cohort that actually complete the requirements of the programme and graduate successfully by the cut-off point and points intermediate
ii. **On time Graduation Rate:**- the percentage of students in each cohort that actually complete the programmes within the expected completion time
iii. **Average time to Graduate:** the average time (in active students' years) taken by each cohort to complete programme. *N.B. active student years is an adjustment to take into account inactive years such namely leave of absence.*
iv. **First Year Retention Rate** (FYR): the proportion of students in each cohort that have maintained their enrolment after the first year
v. **Retention rate:** the cumulative proportion of students in each cohort that actually complete the requirements of the programme and graduate successfully or are still registered pending graduation by the cut-off point and points intermediate
vi. **Attrition rates:** the proportion of students in each cohort that have not completed their programme and have withdrawn over the tracking period.

Table 5.2 shows a summary of throughput statistics for undergraduate programmes at the St Augustine Campus.

Table 5.2: Summary table of Campus Undergraduate Throughput Statistics by Faculty

Faculty	New Enrolment	FYR%	Attrition %	Graduation Rate	On Time Graduation	Average Time to Graduation
Engineering	450	94%	4%	77.6%	48.6%	3.72
Humanities & Education	608	86%	4%	66.2%	51.0%	3.85
Medical Sciences - Medicine	282	88%	0%	81.5%	81.0%	5.29
Science & Agriculture	948	79%	15%	64.4%	39.0%	4.61
Social Sciences	1207	87%	12%	71.6%	53.7%	3.47

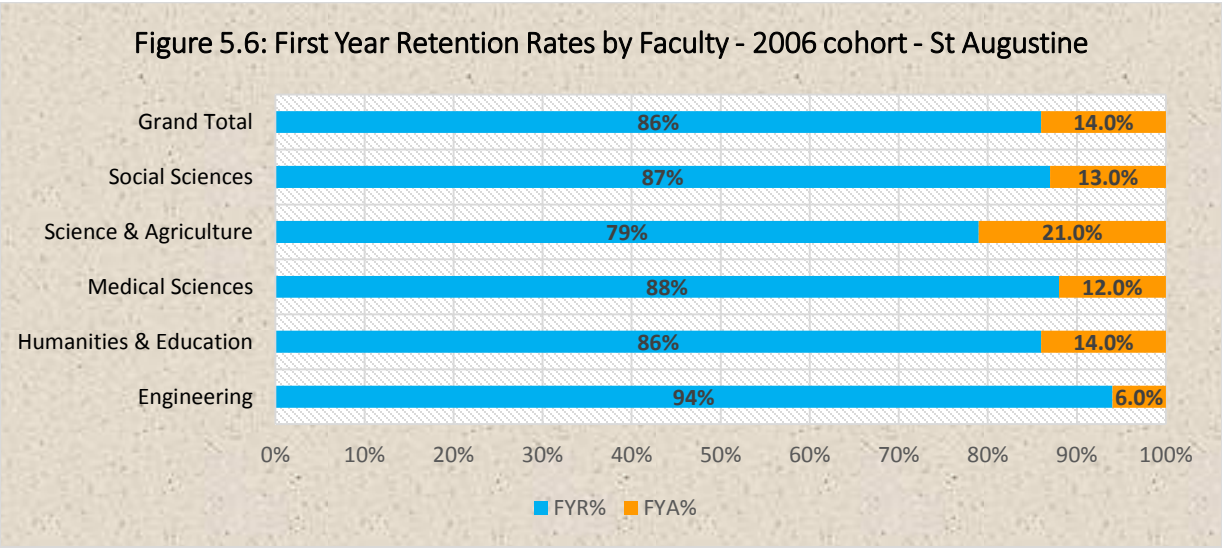
Source: UWI. "A Study on Undergraduate and Postgraduate Throughput of the 2006 Cohort." COPIR, September 2015.

Productivity/Performance Indicator: Undergraduate Retention and Attrition Rates

The FYR is generally considered to be the proportion of students who return after having completed their first year of studies. The issue of persistence (retention of students) is an important one for institutions of higher education where it is seen as a good indicator of the pursuit of educational goals leading to student success and by extension, institutional success. A lower rate of retention may reflect that students' expectations are not being fully met as well as there might be extraneous factors such as financial and personal issues that lead to a student not continuing after their first year. There is also some element of attrition arising from voluntary withdrawals and those students who are required to withdraw (administrative withdrawals) for not meeting academic requirements.

Figure 5.6 present the FYR rates for each faculty as at the end of the cohort's first academic year of study. Overall, the first year retention rates stood at 86 per cent in 2006 with Engineering having the highest rate of 94 per cent and Science and Agriculture having the lowest rate of 79 per cent. This is consistent with an earlier study of the 1995 and 1998 cohort (Greaves and Dass 2000) where first year retention for the campus was approximately 89 per cent indicating a marginal difference.

The attrition rate of this cohort was calculated at 9 per cent. However, at the Faculty level, there was an evident higher attrition rate among students enrolled in the faculties of Social Sciences and Science and Agriculture where the attrition rates were 15 per cent and 12 per cent respectively.

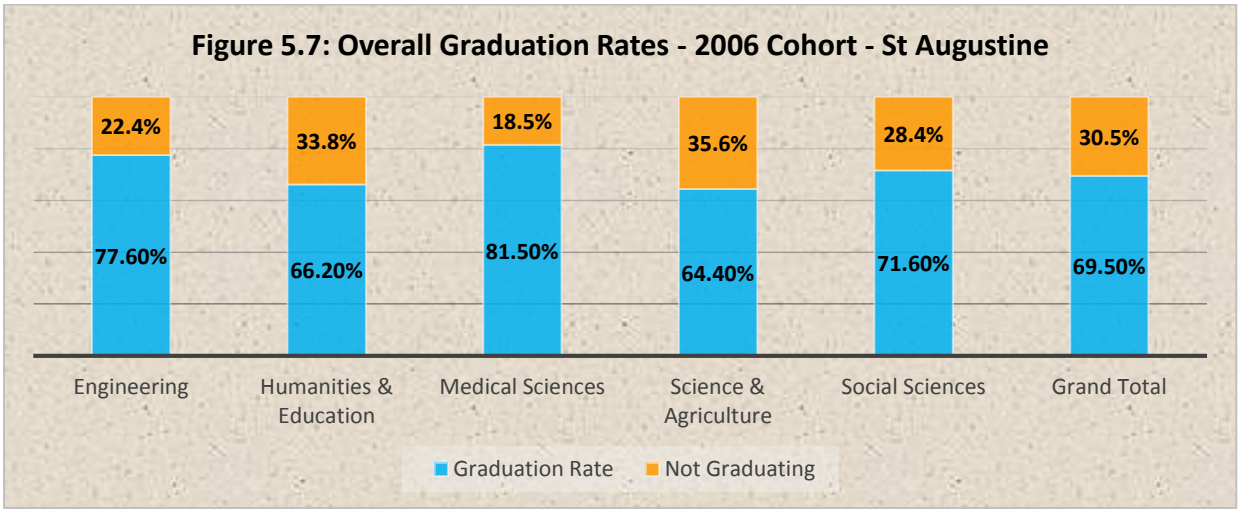


Source: UWI. "A Study on Undergraduate and Postgraduate Throughput of the 2006 Cohort." COPIR, September 2015.

Productivity/Performance Indicator: Graduation rates

International ranking agencies have considered completion and graduation rates as key indicators of institutional performance. According to the League Tables of the *UK Complete University Guide 2015*, data on completion rates suggested that universities that ranked in the top ten had completion rates between 98 to 95 per cent and that the next 100 universities in the ranking had completion rates ranging between 80 to 94 per cent.

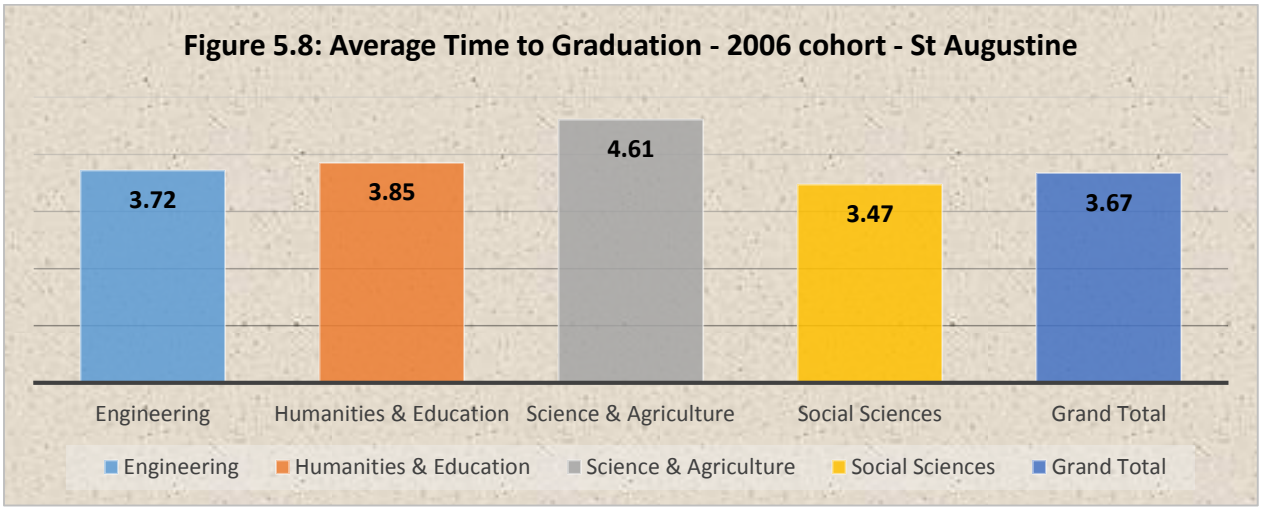
Figure 5.7 shows overall graduation rates by Faculty for the St Augustine Campus. Overall, 69.5 per cent of students entering in the 2006 cohort graduated. When comparing these rates across Faculties, it was noted that Medical Sciences had both the highest graduation rate of 81.5 per cent, while Science and Agriculture had the lowest achieving 64.4 per cent completion rate.



Source: UWI. "A Study on Undergraduate and Postgraduate Throughput of the 2006 Cohort." COPIR, September 2015.

Productivity/Performance Indicator: Average Time to Graduation

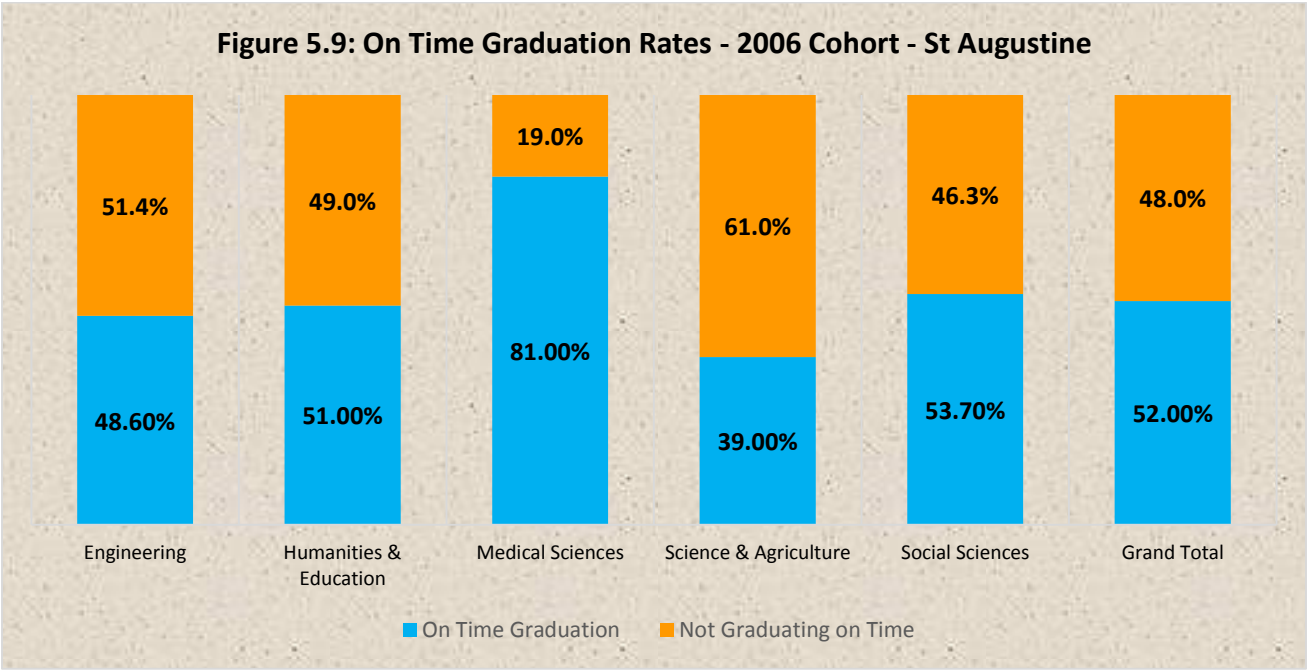
Average time to for full-time undergraduate students to graduate from three-year degree programmes averaged 3.67 academic years, while the expected time to graduate was three years, implying an additional 0.67 years or 22.3 per cent above the expected time. Average time to graduate varied across faculties ranging from a low of 3.47 in Social Sciences to 4.61 in Science and Agriculture (*see Figure 5.8*).



Source: UWI. "A Study on Undergraduate and Postgraduate Throughput of the 2006 Cohort." COPIR, September 2015.

Productivity/Performance Indicator: On Time Graduation Rate and On –time completion

The issue of on-time completion suggests that at the St Augustine Campus, for the 2006 cohort, just under one–half of the graduates completed their programme on-time at the undergraduate level (*see Figure 5.9*). At the Faculty level, Medical Sciences (MBBS) had the highest on time graduation rate of 81 per cent, while Science and Agriculture had the lowest rate with 39 per cent.



Source: UWI. "A Study on Undergraduate and Postgraduate Throughput of the 2006 Cohort." COPIR, September 2015.

High non-completion rates imply wastage of public resources apart from the human costs (financial and emotional) borne by students and their parents. In a time of resource constraints, there must be accountability for financial resources which are committed to funding public higher education of students and also through the GATE programme in respect of funding for tuition fees. The Campus itself would have committed resources to supporting at least 30 per cent of students who did not graduate. It is important therefore to review the impact on budgetary allocations in providing a full university service. The St Augustine study identified a number of possible strategies for improving throughput. These include:

- encourage curriculum design that considers the realities of students' prior learning abilities as well as the transition and special skills and knowledge required for programmes such as Medicine and Engineering;
- promote engaged student learning for active thinking, learning and responding, supported by a range of pedagogies;
- institute a formal tracking and warning system to identify students at risk;
- provide an availability of programmes for remedial work, academic and peer advising; and
- expand the first year orientation and experience to support the non-academic support such as workload management, adapting socially, and 'living on your own' workshop.

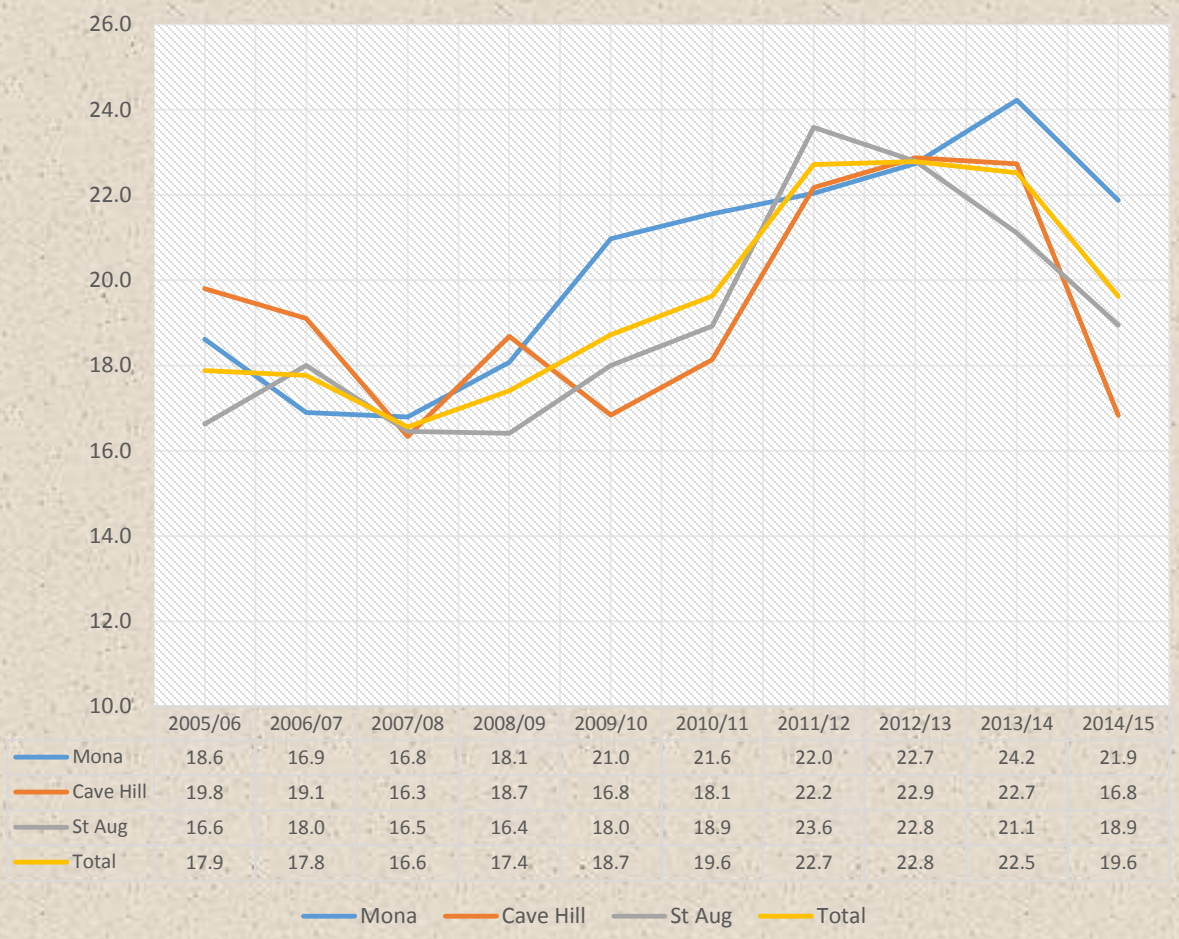
5.1.5. Strategic Theme: Quality of the Student learning experience

The Staff-Student Ratio (SSR) remains a significant measure, seen by universities, accreditation bodies, ranking agencies and compilers of league tables as an indicator of the quality and effectiveness of the student learning experience. It must be noted however that SSR does not directly measure quality and may vary depending on subject type and level of study.

Productivity Indicator: Student-Staff Ratios

International ranking agencies consider SSR as key indicators of institutional performance. According to the *UK Complete University Guide 2015*, the SSR for universities that are ranked in the top 20 ranged between 10.6 and 16.7, while at the latter end i.e. the bottom 20 had ratios between 15.4 and 21.4. Figure 5.10 shows SSR for the UWI as a whole as well as for specific campuses for the period 2005/2006 to 2014/2015. SSR were computed by dividing on-campus full-time equivalent students (1 PT student = 0.5 FTE) by full-time equivalent staff (1 PT Academic Staff = .33 FTE). SSR for the University as a whole increased gradually from 17.9 in 2005/2006 to 19.6 in 2014/2015. On a campus basis, the SSR varied with Cave Hill Campus showing a low of 16.8 to a high of 21.9 for Mona Campus in 2014/2015 *(see Figure 5.10).*

Figure 5.10: Student -Staff Ratios for UWI and by Campus 2005/2006 to 2014/2015



	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Mona	18.6	16.9	16.8	18.1	21.0	21.6	22.0	22.7	24.2	21.9
Cave Hill	19.8	19.1	16.3	18.7	16.8	18.1	22.2	22.9	22.7	16.8
St Aug	16.6	18.0	16.5	16.4	18.0	18.9	23.6	22.8	21.1	18.9
Total	17.9	17.8	16.6	17.4	18.7	19.6	22.7	22.8	22.5	19.6

If one uses SSR as a broad measure of the overall teaching experience of students, on the average, the gradual increase in SSR at the UWI since 2005 can be seen a decline in the overall student experience. However, there was a fall in the SSR in in the 2014/2015 academic year. This fall can be attributed in part to the decline in enrolment at Cave Hill and to a lesser extent, Mona.

5.2. Conclusion

Teaching, Learning and Student Development are among the core business elements of the UWI requiring a significant proportion of the University resources. Enhancing productivity in this area is critical to producing world class graduates equipped with the key attributes necessary for the modern workplace. This section sought to identify key areas where there is scope for productivity enhancements. These include:

- improvement in teaching and course quality, and in particular with academic advising and access to lecturers;
- the overall student experience needs to be enhanced by improving non-academic, social and physical services, in particular, health services, career guidance and placement, security, recreational facilities and transport;

- reallocation of resources towards teaching in areas to fill gaps in the labour market that are in demand and are critical to development and/ or aligned to the needs of the labour market
- enhance the employability of graduates by enhancing the attributes of graduates, particularly in weaker areas;
- reduce unemployment and underemployment of graduates;
- improve throughput rates (based on data from the St Augustine study); and
- improve staff-student ratios.

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CHAPTER SIX: QUALITY IN TEACHING AND LEARNING

The concept of quality is seen as integral to both productivity and performance which the University views as being applicable to the management of all of its human, physical, technological, information and financial resources, internal operations and communications. *See Chapter Two for further discussions on quality and how it is integral to both productivity and performance*.

Quality as a tool that conveys standards and excellence is a proposition that universities uphold through teaching, research and service. The current *Strategic Plan* speaks to excellence in its Mission Statement and quality in relation to three of its six strategic Perspectives: *Internal Operational Processes*; *Teaching, Learning and Student Development* and *Research and Innovation*. However, this chapter investigates the quality of University inputs (teaching factors) and the University's output of graduates. Table 6.1 identifies the various measures used to evaluate productivity and performance in this dimension.

Table 6.1: Quality Productivity and Performance Measures by Type

Objectives	Measures	Classification
Ensure excellence of academic processes	Quality of teaching	Effectiveness
Produce a UWI graduate with the key attributes necessary for the modern work environment	Quality of the graduate	Effectiveness
Ensure the University has a competent workforce to deliver high quality programmes	Quality of staff	Effectiveness
Ensure the University is recognised for excellence in teaching and research	Reputation Surveys	Effectiveness

6.1. Quality Assurance and Accreditation

The four campuses of the University hold institutional accreditation from national Accreditation Agencies – St Augustine Campus (Accreditation Council of Trinidad and Tobago), Mona Campus (University Council of Jamaica), Cave Hill and Open Campuses (Barbados Accreditation Council). Institutional accreditation is an externally driven process which is issued mostly by external quality assurance agencies to assure the quality of provision within an institution. It is the process by which an institution is evaluated against standards set by an accreditation agency (UWI Open Campus website).

While institutional accreditation examines institutional characteristics such as governance, administrative strength, academic policies and procedures, quality of faculty, physical facilities and financial stability, programme accreditation evaluates the quality of teaching and support of learning; design and planning of programmes of study; assessment and feedback to learners; learning environments and learner support systems; programme evaluation and quality assurance systems (ACTT website). The UWI has programme accreditation from specialised bodies e.g. the medical programme on the three campuses and **the** Clinical Medical programme in the Bahamas from the Caribbean Accreditation Authority in Medicine and the Health Professions (CAAM-HP) (UWI StA, UWI Mona websites). Several programmes within the Faculty of Engineering has received accreditation from specialised organisations. For example, in the undergraduate programmes, Chemical and Process Engineering received accreditation from the UK Institution of Chemical Engineers, Electrical and Computer Engineering from the Institution of Engineering & Technology (IET) and at the postgraduate level, programme accreditation was received from the UK Institute of Materials, Minerals, Mining and the UK Energy Institute for the M.Sc. in Petroleum Engineering; UK Institution of Mechanical Engineers (IMechE) for the MSc in Production Engineering & Management (UWI StA FoE website). The Mona School of Business and Management (MSBM) received accreditation from the Association of MBAs (AMBA) for its EMBA and MBA programme (UWI Mona MSB website).

The UWI conducts both quality assurance reviews and quality evaluations. As explained by the Board of Undergraduate Studies (Sept 2015, 6), quality evaluations are reviews of the processes and procedures in place within each department to monitor quality aimed at continuous quality enhancement, while quality assurance reviews involve a team of reviewers, led by a senior international academic, the quality evaluation exercises are conducted by the programme officers of the University Quality Assurance Unit (QAU). Box 6.1 identifies key findings of the quality of student learning within the University.

Box 6.1: The quality of student learning within the University

The quality assurance (QA) review process, evidenced by reports of quality assurance review teams, speaks to varying degrees about the quality of student learning within The University. Facilitating an assessment of fitness for purpose, or lack thereof, the QA process produces such information through triangulated stakeholder feedback, and an examination of facilities, including outreach and research sites. Review teams also seek to assess the effective functioning of the quality management system through an examination of pertinent documentation. Over the strategic planning period 2012-2017, quality assurance review teams have commented on the strengths and weaknesses, inter alia, of teaching, learning, research and outreach at The UWI and have made recommendations, where necessary, to improve the student learning experience. Follow-up action at the level of academic entities and campuses is required for continuous improvement.

Strengths

Among the strengths review teams have identified at the undergraduate level are curricula seen, in some cases, to be supportive of quality student performance. Assessment was described as incorporating a range of well suited methods, with endorsement of the standard of marking by some external examiners. Some students expressed satisfaction with their lecturers' knowledge and competencies, teaching and learning activities, and programmes that were comprehensive, rigorous and well-taught. In a few cases, review teams reported evidence of graduates embodying the Key Attributes of The UWI Graduate. Graduates were also considered to be well equipped theoretically.

At the postgraduate level, student output in the form of their contributions to seminars, conferences and other forms of research dissemination, including academic papers written with lecturers, was also seen as an indicator of the quality of student learning. Some postgraduate students expressed satisfaction with their programme, with assessment methods and with the tutorial system. Graduates of some postgraduate and research degree programmes were described as possessing skills required for the work force. The provision of support for taught postgraduate programmes was found to be appropriate overall. Reviewers also reported that UWI research training programmes were logical, focused, disciplined and rigorous.

Weaknesses

In respect of the quality of undergraduate learning, assessment; high failure rates; declining student performance; lack of timely feedback to students; lack of engaging tutorials; over-reliance on group work and inadequate access to online teaching were among weaknesses identified by quality assurance review teams. A recurring area identified for improvement, based on feedback from employers and postgraduates themselves, was UWI graduates' deficiency in writing skills, especially in report and scientific paper writing. Also in need of improvement to preserve the quality of undergraduate student learning were access to additional state-of-the-art software for specific sub-specializations, and enhancement of student learning by participation in structured work-based learning activities, such as internships, to produce graduates who are prepared for industry at the end of their studies. In this regard, some employers reported lack of satisfaction with UWI graduates who were not:

- Strategic thinkers
- Prepared for management roles
- Able to use their own initiative

- Researchers but more like lab technicians
- Analytical with regard to using data
- Able to work without supervision, in some cases

Concern was also expressed about the need to ensure that student intake did not overwhelm the facilities available. Having regard to the critical importance of consistency as a catalyst for the quality of student learning, review teams noted that variability across work-based learning sites was not planned for or controlled well enough to ensure that cohorts of students, dispersed across different sites, had equivalent experiences and, by extension, equivalent learning.

In terms of postgraduate and research degrees, weaknesses identified in the quality of learning included accessibility of supervisors; supervisors' response timeframes, ineffective feedback and inadequate attention to academic writing; disappointingly little attention to transferable skills; inadequate resources for research and practical work; lack of dissemination of staff research to the postgraduate student body; the schedule for lectures and tutorials failing to accommodate students living far away from campus, resulting in student absenteeism; low levels of throughput, and high variability of graduates' skills and competencies. Students and interns were dissatisfied with the registration and campus ID access mechanisms as these relate to libraries in particular. Difficulties with access to subscriptions to certain electronic databases and the largely absent formal Staff/Student Liaison Committee structure that would illuminate postgraduate students' concerns also featured among weaknesses identified.

Prepared by: Quality Assurance Unit, OBUS.

In the *Strategic/Operational Plan,* several initiatives were identified to advance the theme, A*cademic Quality.* Based upon an analysis of the strategic objectives-to-strategic initiatives, the following completed initiatives were identified from Campus/Vice Chancellery reports submitted in March, 2016.

- Ensure consistency of all programmes with OBUS (Office of the Board of Undergraduate Studies) guidelines (Vice Chancellery);
- Campus Coordinators to be part of follow-up process of Quality Assurance Review recommendations to departments re graduate studies (Vice Chancellery); and
- Work with Office of Research with respect to response of Institutes and Research Centres to Quality Assurance Reviews (Vice Chancellery).

In Chapter Two, quality was defined citing Harvey and Stensaker (2007). In April 2015, a University Task Force on Quality, chaired by the PVC, BUS (Board of Undergraduate Studies) was established, which grew out of a proposal drafted by the QAU for an integrated quality management system at the University. The Task Force recommended *inter alia* the development of an overarching UWI Quality Policy that would articulate a UWI-wide integrated quality management system and establish a Quality Management Team. The Task Force on Quality also asked stakeholders about the general framework of interrelated dimensions of quality in higher education (2016, 333). In so doing, the Report (2016, 33) identified that "fitness for purpose", which focusses on the attainment of stated mission and objectives, is the concept of quality employed by The UWI, and was selected by 20% of respondents. Most respondents, 23%, just marginally more, identified "fitness of purpose", which relates to relevance to the needs of key stakeholders. In practice, however, both "fitness for purpose," and "fitness of purpose" are important elements of quality at The UWI. The concepts of "transformation", value for money, consistency and being exceptional were also seen to be important to respondents (2016,33). The survey findings also confirmed the need for an overarching UWI quality policy. This policy must provide for oversight of activities related to university and campus policies and procedures, workflows, monitoring and data driven decision making

as well as address strategies for pooling and sharing of information to positively impact institutional effectiveness both at campus level and at university level, inter alia. (p. 34)

6.2. Measuring productivity and performance

This section will examine quality relating to the productivity and performance. Data are drawn from the student experience surveys and the employer survey. For the purposes of this study, the following ratings are used.

4 and higher	Very Strong level of satisfaction
3.50 to 3.99	Strong level of satisfaction
3.00 to 3.49	Moderate satisfaction
2.50 to 2.99	Low level of satisfaction
1.99 and less	Very Low level of satisfaction

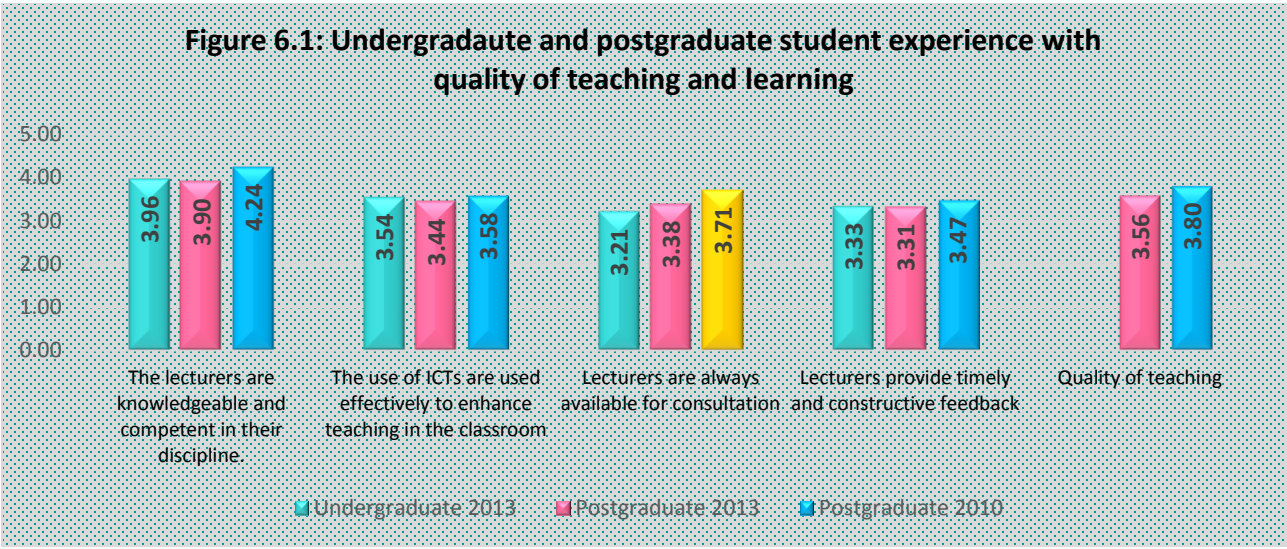
6.2.1. Quality of teaching and learning

In considering quality of teaching and learning, the focus should be on curricula, pedagogy, current knowledge and skills which is useable in the labour market and forms the basis for graduates' employability and lifelong learning, and contributes to their functioning within the wider society. The measures explored are related to opinion of students and alumni on the quality of teaching and the perception of how well the attributes were infused in learning. Attention is also drawn to the quality of graduates based upon insights from the employers.

Productivity measure: Quality of Teaching Environment

Both the undergraduate and postgraduate student experience surveys show a strong-to-moderate satisfaction rating for the elements relating to quality of teaching *(see Figure 6.1)*. Strong levels of satisfaction were seen with the quality of teaching and lecturers being knowledgeable and competent in their disciplines. Attention is drawn to the strong ratings for lecturers' ability to provide timely and constructive feedback. The overall mean rating for the undergraduate student experience survey (SYM) in 2013 was 3.51 and for the postgraduate student experience survey (PG-SES) it was 3.51 in 2013 and 3.75 in 2010. Caution should be exercised in interpreting the data given the minor differences in methodology and variations in response rates between surveys.

Among taught postgraduates, the statement 'quality of teaching is consistently good' was rated as strong in both 2010 and 2013 with mean scores of 3.80 and 3.56, respectively.



Note: The SYM for the university level was only undertaken in 2010.

Perception of the development of the key attributes

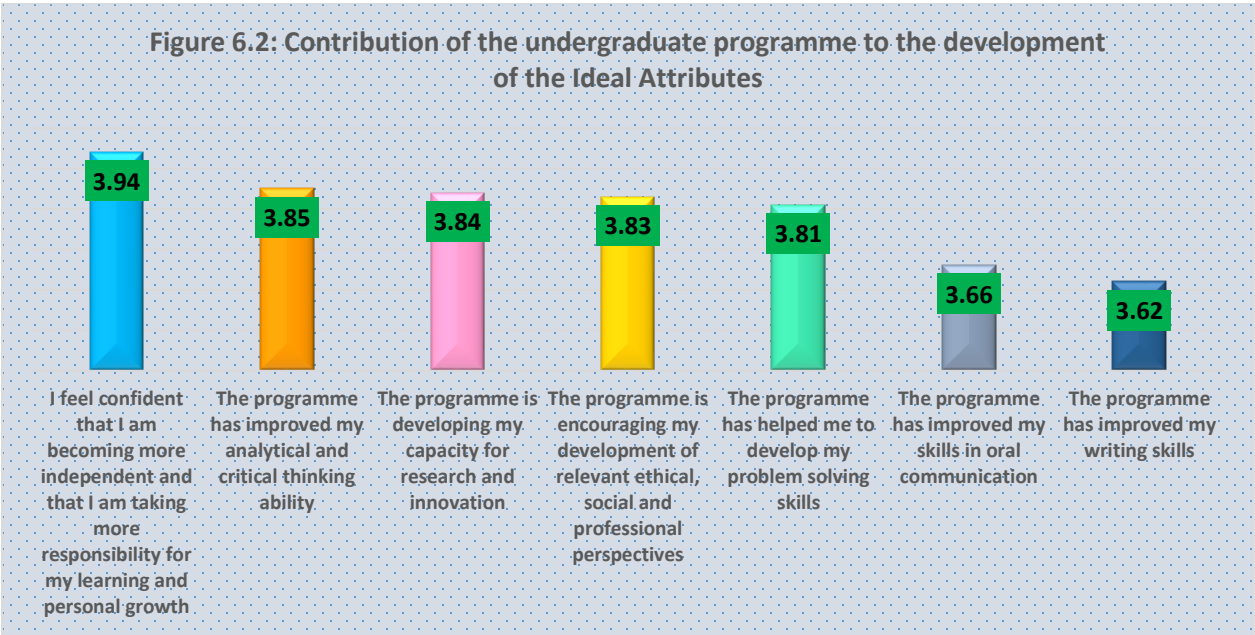
According to the UWI *Strategic Plan, 2012-2017,* the key attributes of the UWI graduate, both undergraduate and postgraduate, refer to those academic abilities, transferable skills, personal and professional qualities that should be acquired by students during their time at the University, regardless of their discipline of study (32). These qualities developed/enhanced during student's life at University enable a work-ready graduate who is capable of functioning in society. The SYM and the PG-SES asked students how the programme contributed to the development of the attributes borrowing from the *2007-2012 and 2012-2017 Plans* (see Box 6.2). Caution should be exercised in interpreting the data given the minor differences in methodology and variations in response rates between surveys.

Box 6.2: Attributes of the UWI Graduate

Attributes of the distinctive UWI graduate, 2007-2012	Key attributes of the UWI graduate (2012-2017)
• A Critical and Creative Thinker • A Problem Solver • An Effective Communicator • Knowledgeable and Informed • Competent • A Leader • A Team Player • It Skilled and Information Literate • Socially and Culturally Responsive • Ethical • Innovative and Entrepreneurial • A Lifelong, Self-Motivated Learner	• A critical and creative thinker • An effective communicator with good interpersonal skills • IT-skilled and information literate • Innovative and entrepreneurial • Globally aware and well-grounded in his/her regional identity • Socially, culturally and environmentally responsible • Guided by strong ethical values

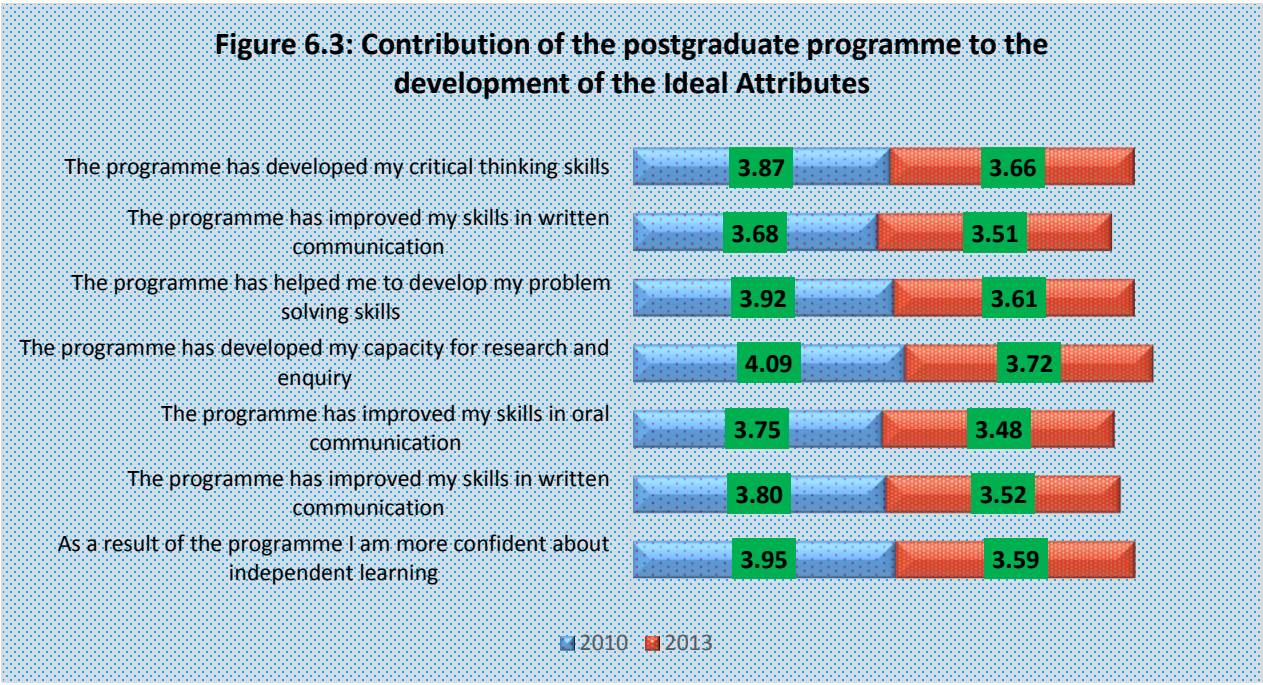
Sources: UWI. *Strategic Plan, 2007-2012.* 2007, 14; UWI. *UWI Strategic Plan, 2012-2017*. 2012, 24.

Results from the SYM 2012 showed a strong level of satisfaction with the contribution of the programme to the development of the attributes *(see Figure 6.2)*. This was seen in the overall ratings which had a score of 3.80.



Source: SYM 2013.

The common set of attributes for the PG-SES 2010 and 2013 show ratings that were generally strong *(see Figure 6.3)*. For 2010, the item, "the programme has developed my capacity for research and enquiry" earned a very strong score of 4.20, but fell marginally in 2013. Also, in 2013, the item "the programme has improved my skills in oral communication" fell marginally from 3.75 in 2010 to 3.48 in 2013.



Source: PG-SES 2010, 2013

See Chapter Five for a discussion on the how alumni (graduates) rated the extent to which their UWI education contributed to their personal and professional development.

The Employer Survey, which was administered in 2010/2011, was done was to obtain direct feedback from employers on their satisfaction with the performance of the UWI graduate in the workplace. While all major industries in Trinidad and Tobago and Barbados were somewhat satisfied with the UWI graduate's general qualities and general skills required to perform the duties of the job, the major industries in Jamaica indicated that they were very satisfied with the general qualities of the UWI graduate and somewhat satisfied with their general skills.

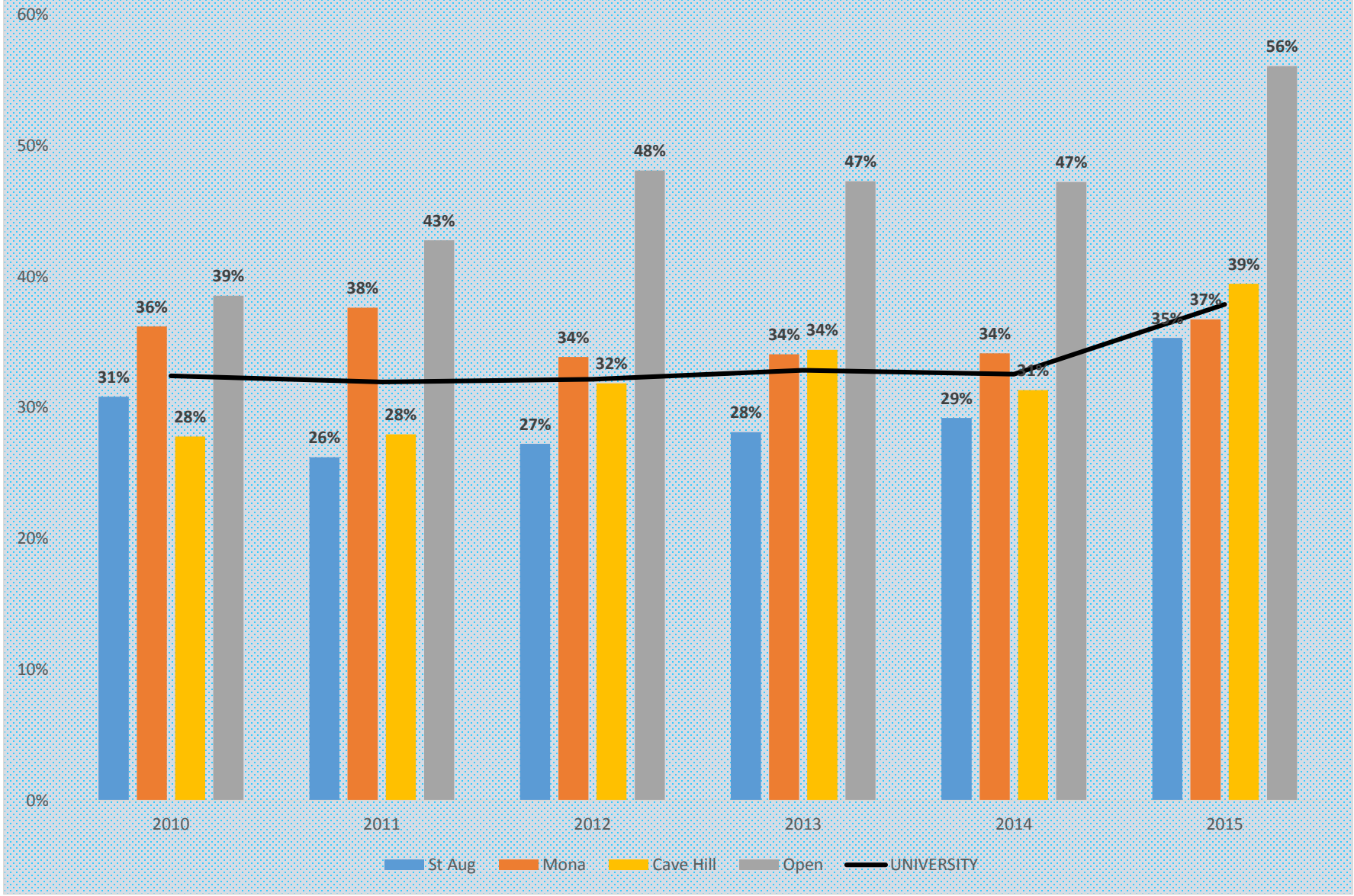
The survey found that the common positive attributes of the UWI graduates according to employers were: sociable with others on the job; showed ownership and commitment to their job and were proficient. The best attributes of the UWI graduates were as follows: graduates displayed sound theoretical and technical knowledge for the job and showed a willingness to learn (Trinidad and Tobago); displayed initiative, commitment and confidence (Jamaica); and were detailed, have good research skills, are willing to learn and are problem solvers (Barbados).

The worst attributes of the UWI graduates were as follows: arrogant and lacked initiative and leadership skills (Trinidad and Tobago); arrogant and lacked assertiveness (Jamaica) and as arrogant and have unrealistic expectations (Barbados). Employers in Barbados also indicated that the UWI graduates possess poor communication/presentation skills (both written and oral).

6.2.2. Quality of the graduate - Good Honours

One indication of the quality of graduates produced by universities is the proportion of "Good Honours" degrees earned by the institution's graduates. For the purposes of this *Report*, Good Honours degrees are defined as first class honours and upper second class honours degrees. Figure 6.4 shows the percentage of first degree graduates that earned Good Honours degrees at the University and campus levels. The data show that approximately a third of all graduates earned Good Honours from the period 2009/2010 to 2013/2014, this percentage increased slightly to 38 per cent in 2014/2015 *(see Figure 6.4).* The Open Campus awarded the highest proportion of Good Honours degrees, the percentage of Good Honours degrees awarded ranged from 39 per cent to 56 per cent during the six-year period. From 2011/2012 onwards, graduates from the St. Augustine campus had the lowest proportion of Good Honours degrees awarded in comparison to the other University sites.

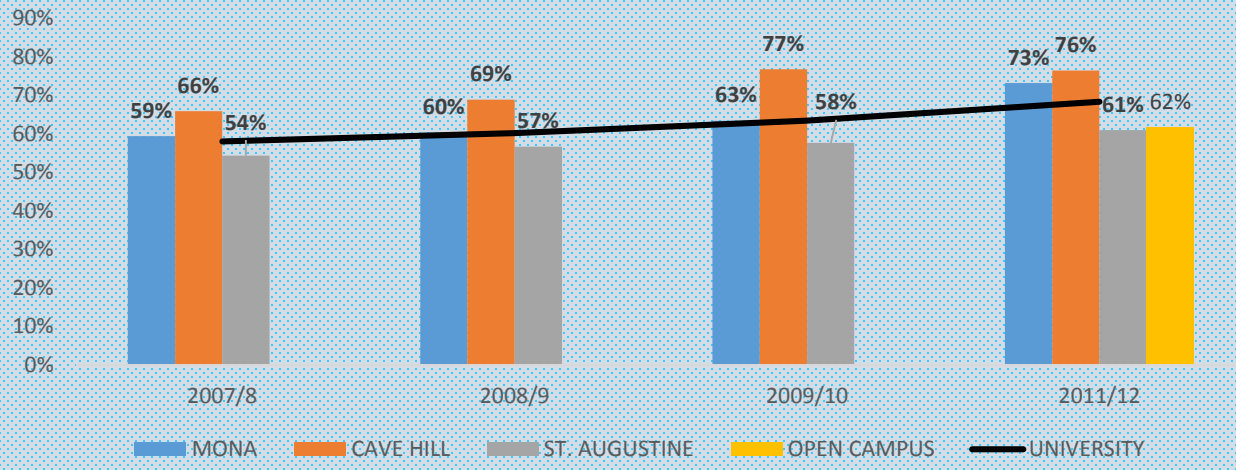
Figure 6.4: Percentage of Good Honours Awarded by Campus



6.2.3. Academic Staff with the PhDs

Highly qualified academic staff is an essential input for high quality education and research produced by a university. The proportion of full-time academic staff that have earned a doctoral degree can be used as an indicator of the quality of academic staff employed by the UWI. Available data for 2007/2008 to 2009/2010 and 2011/2012 show that the percentage of academic staff employed at the University with doctorates have increased for the four years from 58 per cent to 68 per cent. Each of the residential Campuses showed an increase in the proportion of academic staff with doctorates during the period. The Cave Hill Campus had the highest percentage of staff with doctorates (66 per cent to 76 per cent during the period), while the St. Augustine Campus had the lowest proportions where the percentage of PhD qualified staff ranged from 54 per cent to 61 per cent *(see Figure 6.5)*.

Figure 6.5: Percentage of Academic Staff with a PhD degree by Campus



6.2.4. Reputation Surveys

The *THE* Reputation Surveys ask scholars at the level of their specific subject discipline to identify no more than 15 universities which they believe are the best in each category (research and teaching), based on their own experience. The final reputation table ranks institutions according to an overall measure of their esteem that combines data on their reputation for research and teaching. More weight is given to research so, that final score is a ratio of 2:1. The reputational scores are based on the number of times an institution is cited by respondents as being the best in their field. The number one institutions is scored at 100 and all other institutions are expressed as a percentage of the number one institution on the reputational table. The Reputation Survey is seen as a proxy of quality as having a strong reputation in the areas means that the institution will be cited numerously as best in the field.

The UWI, generally, performs very poorly in the reputational ranking falling in the bottom 5 per cent based upon data available for 2012 and 2015 *(see Table 6.2).*

Table 6.2: UWI's Reputation Surveys

	2012	2015
Teaching Reputation	3	1
Research Reputation	1	2

Source: Thomson Reuters. *Global Institutional Profiles: The UWI.* 2012, 2015.
Note: Values on tables are cumulative probability scores, representing your institution's place compared to other institutions.

6.3. Conclusion

The chapter examined the concept of quality from a narrow perspective - the quality of University inputs (teaching factors) and the University's output of graduates. The chapter considered the perception of the quality of teaching from the student and employer perspective and referenced the alumni/graduate (see Chapter Five), the quality of the graduates and teaching staff. Additional indices of quality in the area of teaching and learning could be considered such as: course evaluation scores, student entry scores, attrition rates, time-to-complete graduate degrees, and SSR (some of which was discussed in Chapter Five). It is hoped that the University Task Force on Quality will identify effective measures for monitoring quality.

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CHAPTER SEVEN: RESEARCH PRODUCTIVITY AND PERFORMANCE MEASURES

Research (basic and applied) plays a critical role in the discovery of new knowledge which can translate into innovation that is reflective of performance of research capabilities. Given the global and regional economic, environmental and social challenges, a robust research and innovation culture is required to support the demands of the knowledge economy and provide solutions to the developmental challenges. Universities as educational institutions are involved *inter alia* in knowledge creation, which also forms part of the mission. As such, they are generally engaged in expanding their research capacity and stimulating innovation so as to contribute to local and regional development and growing revenues that result from research activities. Grigore et al (2009,5) noted that not only are "universities …. seen as pools of knowledge for the future technological, economic and social progress", but are also "perceived as gateways to global information and support for regional development [and] provide their region with intelligence (in the form of human resources and R&D outputs); [and] are implicated in planning the improvement of regional infrastructure and the quality of the environment." The UWI seeks to address the research, knowledge creation and innovation element of its mission by focussing on the priority areas aligned to specific developmental needs of the Caribbean region.

7.1. Caribbean Development in the context of International Efficiency Indices

The Global Competitiveness Index (GCI), which assesses the competitiveness landscape of over 100 countries, provides insight into the drivers of their productivity and prosperity. The GCI Report identifies three main stages of development: factor-driven, efficiency driven, and innovation driven each requiring various interventions but important for the productivity and thus, prosperity of a country.[12] From the perspective of education, a factor driven economy relies on basic education, while an efficiency driven economy depends on higher education and training. An innovation based economy is based on research and development as well as flows of knowledge. Data extracted from the GCI focussing on the pillars related to higher education and training and innovation for Barbados, Jamaica and Trinidad and Tobago show that these countries are performing at an average level on the higher education and training pillar and below average on the innovation pillar *(see Table 7.1)*.

The Global Innovation Index (GII) captures the multi-dimensional facets of innovation and provides the tools that can assist in tailoring policies to promote long-term output growth, improved productivity, and job growth. The Index relies on two sub-indices, the Innovation Input Sub-Index and the Innovation Output Sub-Index, each built around key pillars.[13] It generally ranks the Caribbean in the low to middle range with relatively low rates of innovation efficiency *(see Table 7.2)*.

[12] The GCI combines 114 indicators that capture concepts that matter for productivity. These indicators are grouped into: (i) **factor-driven (basic requirements)** - institutions, infrastructure, macroeconomic environment, health and primary education, (ii) **efficiency driven** - higher education and training, goods market efficiency, labour market efficiency, financial market development, technological readiness, market size, (iii) **innovation driven** - business sophistication, and innovation.

[13] Five input pillars capture elements of the national economy that enable innovative activities: (i) Institutions, (ii) human capital and research, (iii) infrastructure, (iv) market sophistication, and (v) business sophistication. Two output pillars capture actual evidence of innovation outputs: (vi) knowledge and technology outputs and (vii) creative outputs. Each pillar is divided into sub-pillars and each sub-pillar is composed of individual indicators (79 in total). Sub-pillar scores are calculated as the weighted average of individual indicators; pillar scores are calculated as the weighted average of sub-pillar scores. Four measures are then calculated: (i) the innovation input sub-index is the simple average of the first five pillar scores; (ii) the innovation output sub-index is the simple average of the last two pillar scores; (iii) the overall GII is the simple average of the input and output sub-indices; and (iv) the innovation efficiency ratio is the ratio of the output sub-index over the input sub-index.

Table 7.1: Rank and scores for higher education and training and innovation pillars on the competitiveness index, 2010-2014												
Country	**2010**				**2012**				**2014**			
Index	**Efficiency**		**Innovation**		**Efficiency**		**Innovation**		**Efficiency**		**Innovation**	
Pillars	**Higher Education and Training**		**Innovation**		**Higher Education and Training**		**Innovation**		**Higher Education and Training**		**Innovation**	
	Rank (142)	**Score (1-7)**	**Rank (142)**	**Score (1-7)**	**Rank (144)**	**Score (1-7)**	**Rank (144)**	**Score (1-7)**	**Rank (140)**	**Score (1-7)**	**Rank (140)**	**Score (1-7)**
Barbados	25	5.1	49	3.4	20	5.3	48	3.5	*Data not available*			
Jamaica	85	3.9	94	2.9	80	4.1	83	3.1	84	4.1	67	3.3
Trinidad and Tobago	64	4.2	86	3.0	75	4.2	107	2.9	73	4.3	101	3.1

Sources: World Economic Forum. *The Global Competitiveness Report 2011/2012.* Geneva: World Economic Forum, 2011. http://www3.weforum.org/docs/WEF_GCR_Report_2011-12.pdf.
World Economic Forum. *The Global Competitiveness Report 2013-2014.* Geneva: World Economic Forum, 2013. http://reports.weforum.org/the-global-competitiveness-report-2013-2014/
World Economic Forum. *The Global Competitiveness Report 2015-2016.* Geneva: World Economic Forum, 2015. http://www3.weforum.org/docs/gcr/2015-2016/Global_Competitiveness_Report_2015-2016.pdf.
Note: *Higher education and training* includes the following sub-indicators: quantity of education, quality of education and on-the-job training. The sub-indicators for *Innovation* are: capacity for innovation, quality of scientific research institutions, company spending on R&D, University-industry collaboration in R&D, government procurement of advanced technology products, availability of scientists and engineer, and PCT patent applications applications/million population.

Table 7.2: Rank and scores for the Global Innovation Index, 2010-2014												
Country	**Global Innovation Index**		**Innovation Output Sub-index**		**Innovation Input Sub-index**		**Innovation Efficiency Index**		**Human Capital and Research**		**Knowledge and Technology Outputs**	
2012 (141 countries. Scores 0-100)												
	Rank	**Score**	**Rank**	**Score**	**Rank**	**Score**	**Rank**	**Score**	**Rank**	**Score**	**Rank**	**Score**
Barbados	*Data not available*											
Jamaica	91	30.2	107	22.1	77	38.2	130	0.6	68	34.5	139	11.7
Trinidad and Tobago	81	32.5	84	26.0	74	39.0	97	0.7	63	37.1	98	21.5
2014 (143 countries. Scores 0-100)												
	Rank	**Score**	**Rank**	**Score**	**Rank**	**Score**	**Rank**	**Score**	**Rank**	**Score**	**Rank**	**Score**
Barbados	41	40.8	53	33.2	38	48.3	87	0.7	58	31.6	33	38.0
Jamaica	91	30.2	107	22.1	77	38.2	130	0.6	68	34.5	139	11.7
Trinidad and Tobago	90	31.6	98	24.5	86	38.6	81	33.2	68	29.2	102	21.9

Sources:
INSEAD and WIPO. *The Global Innovation Index 2012: Stronger Innovation Linkages for Global Growth*. Fontainebleau: INSEAD, 2012. https://www.globalinnovationindex.org/userfiles/file/GII-2012-Report.pdf.
Cornell University, INSEAD, and WIPO. *The Global Innovation Index 2014: The Human Factor In Innovation*. second printing. Fontainebleau, Ithaca, and Geneva. 2014. https://www.globalinnovationindex.org/userfiles/file/reportpdf/GII-2014-v5.pdf.
Note: Scores and rankings from one year to the next are not directly comparable as they are adjusted. As such, though data is available for 2010 they methodological differences. GII Reports advise that making inferences about absolute or relative performance on the basis of year-on-year differences in rankings can be misleading. Each ranking reflects the relative positioning of that particular country/economy on the basis of the conceptual framework, the data coverage, and the sample of economies—elements that change from one year to another.
Human capital and research: The level and standard of education and research activity in a country are the prime determinants of the innovation capacity of a nation. This pillar tries to gauge the human capital of countries through three sub-pillars: education tertiary education and research and development.
Knowledge and Technology Outputs: This pillar covers all those variables that are traditionally thought to be the fruits of inventions and/or innovations. The first sub-pillar refers to the creation of knowledge, knowledge impact and knowledge diffusion.

7.2. THE UWI CONTEXT

At the UWI, research is seen as part of the core function for academic staff. In the view of Altman et al (2009, 104), "the performance of researchers, groups of researchers, departments, schools, colleges, and universities has to be quantified, requiring an objective evaluation of researchers' productivity." The focus for collecting research productivity data relies on the "efficiency of knowledge creation and knowledge transfer of researchers within an academic community by using tools for collecting and evaluating data about the researchers' output and their collaboration activities" (Altman et al 2009, 106). To this end, it is worth exploring how the concept of productivity and performance is manifested at the University.

The UWI *Strategic Plan, 2012-2017* identified *Research and Innovation* as one of the six Perspectives with 'Faculty led Innovation', 'Graduate Studies and Research', and 'Funding and Partnerships' as its strategic themes. This Perspective is seen as "one of the key areas in which the University can distinguish itself from its competitors and enhance its international reputation" by way of strengthened support systems to foster cutting-edge research and innovative outputs from faculty and postgraduate students, and commercialisation of cutting-edge research which will also provide an additional revenue stream and improve visibility of the UWI's research (34). As such, the productivity and performance measures used is influenced by the needs of the *Strategic Plan, 2012-2017* and are also the areas where greater energy is needed if the performance of the University is to be enhanced to be more competitive and globally recognised *(see Table 7.3).* Data for this section was sourced from administrative sources, institutional surveys and rankings.

TABLE 7.3: RESEARCH PRODUCTIVITY MEASURES

Objective	Indicator	Type
Increase the number of peer-reviewed publications and citations	Number of academic research publications	Effectiveness
	Number of research publications per FTE Academic Staff	Efficiency
Increase in doctoral productivity	Number of PhD graduates	Effectiveness
	Number of PhD graduates per academic FTE	Efficiency
External research funding	External Research Income (USD)	Efficiency
	External Research Income per FTE academic staff (USD)	
Research expenditure	Expenditure spent on research	Efficiency
	Expenditure spent on teaching	
	Expenditure spent on other activities	
Enhance graduate studies	Postgraduate satisfaction with research opportunities	Effectiveness
	Postgraduate satisfaction with training in research methods	
	Overall experience of the research programme	

7.3. Assessment of productivity and performance in research and innovation

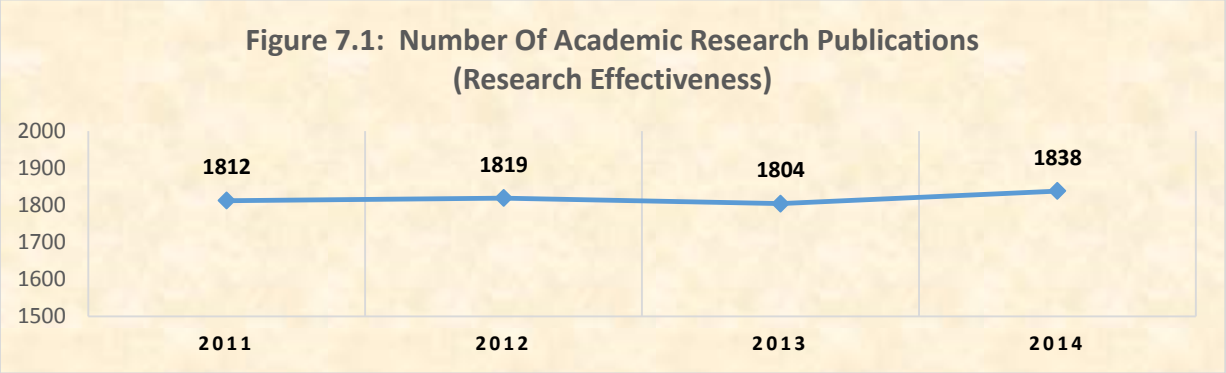
As previously noted, the research productivity of the UWI can be assessed by examining the level or magnitude of research activity, the efficiency of the University's research activities and the quality of research. Part of this assessment requires tracking UWI's research productivity over time as well as benchmarking UWI's research performance to similar and aspirational HEIs. The data in this section of the report presents firstly, institutional research productivity trends, and secondly, external comparisons of the UWI's research performance to selected peer and aspirational institutions.

7.3.1. Research Productivity Trends

This section examines the trends in research publications, research income and expenditure, doctoral productivity and postgraduate satisfaction with elements of their research programme.

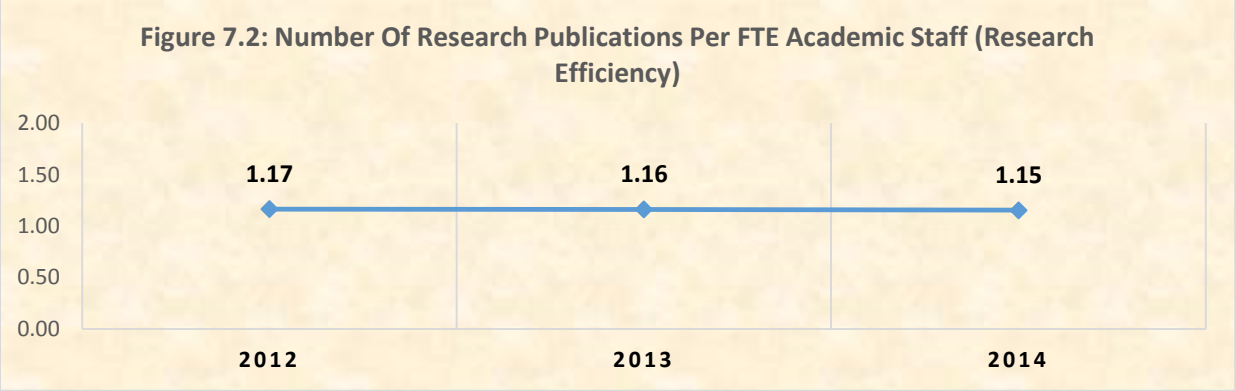
Research Publications

The number of refereed publications in academic journals is an indicator of effectiveness that measures the level of research output. The number of refereed research publications produced by the UWI (as indexed in the Web of Science database) remained relatively stable at approximately 1,800 publications for the period 2011 to 2014 *(see Figure 7.1)*. Examining the number of publications relative to the number of FTE staff gives an indication of research efficiency. The number of publications per FTE staff also remained constant at approximately one academic publication per FTE academic staff for the period 2011 to 2014 *(see Figure 7.2)*.



Source: U-Multirank submissions.

Note:. Articles published in regional journals may not be included in the Web Science database, and as a result may not be included in the calculations for this indicator.



Source: U-Multirank submissions.

Note:. Articles published in regional journals may not be included in the Web Science database, and as a result may not be included in the calculations for this indicator.

Box 7.1: Further Examination of Research Productivity at the UWI Mona campus

The Office of Planning and Institutional Research at the UWI Mona campus conducted a study into the performance of academic staff at their campus in May 2013. The study reviewed data culled from departmental reports spanning the period 2007/8 to 2011/12 and included measures related to the output of academic staff. Findings from the report show that the number of peer reviewed publications per full-time instructional staff ranged from 1.2 to 1.5 during the period (see table below). The Faculty of Medical Sciences had the highest per FT instructional staff publication rates during the period (ranging from 2.2 in 2007/8 to a maximum to 2.8 in 2008/9 and 2009/10).

The report showed that the number of conference presentations stayed at an average of one presentation per FT staff during the period and the faculty with the highest ratio of conference presentations was also the Faculty of Medical Sciences.

The ratio of funded research projects (internally and externally funded) per FT instructional staff remained at a figure of 0.2 for most of the period, the Faculty of Science and Technology had the highest ratios for the five-year period (ratios ranged from 0.3 in 2010/11 and 2011/12 to a high of 0.5 in 2008/9).

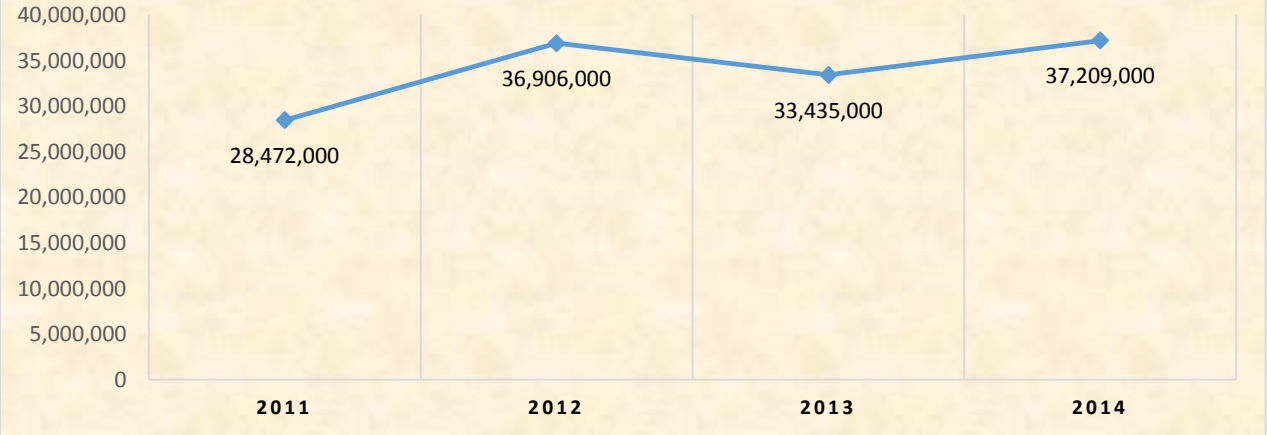
Research Output per Full-time Instructional Staff

	2007/8	2008/9	2009/10	2010/11	2011/12
Peer Reviewed Publications per FT instructional staff	1.2	1.5	1.5	1.3	1.4
Conference Presentations per FT instructional staff	1.1	1.2	1.1	1.0	1.1
Funded research projects per FT instructional staff	0.2	0.3	0.2	0.2	0.2

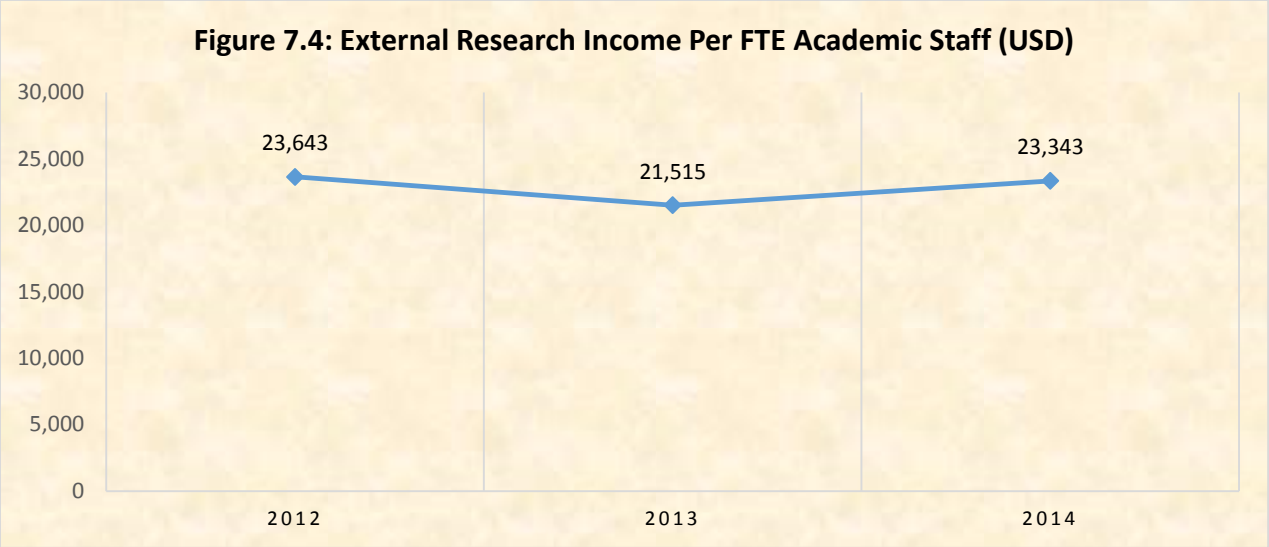
Source: Performance of Academic Staff at the UWI, Mona 2007/8 to 2011/12 (May 2013).

The research performance of a university can be assessed by its success in obtaining grants from international, competitive, peer reviewed programmes. Figure 7.3, shows the quantum of external research grants secured by the University from 2011 to 2014. The amount of external funds secured by has shown sustained growth during the period, the amount of University external grants increased by approximately 3.1 per cent, moving from US$28 million in 2011 to US$37 million in 2014. The total external research income per academic FTE decreased slightly in 2013 but increased to approximately US$23,000 per academic staff member in 2014 *(see Figure 7.4).*

Figure 7.3: External Research Income (USD)



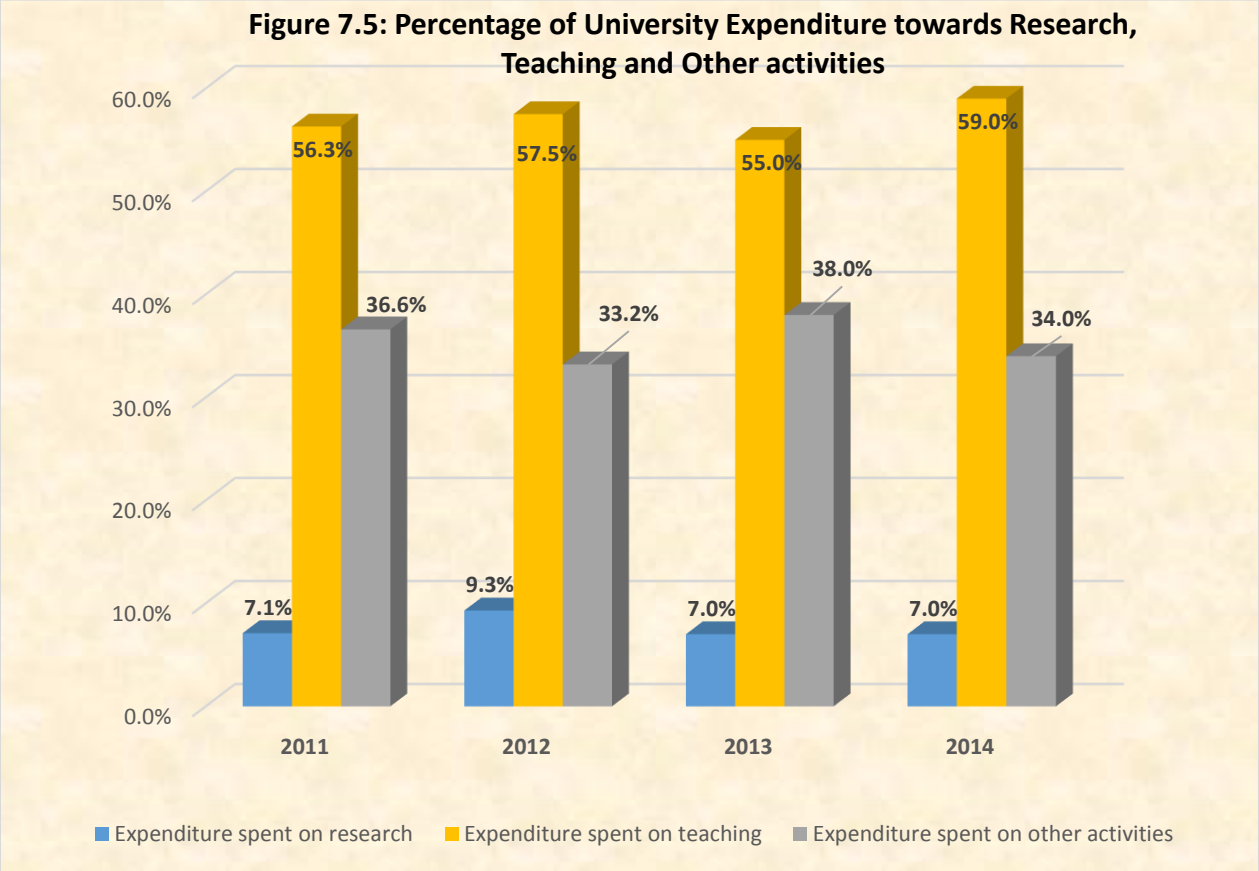
Source: U-Multirank submissions.



Source: U-Multirank submissions.

Research Expenditure

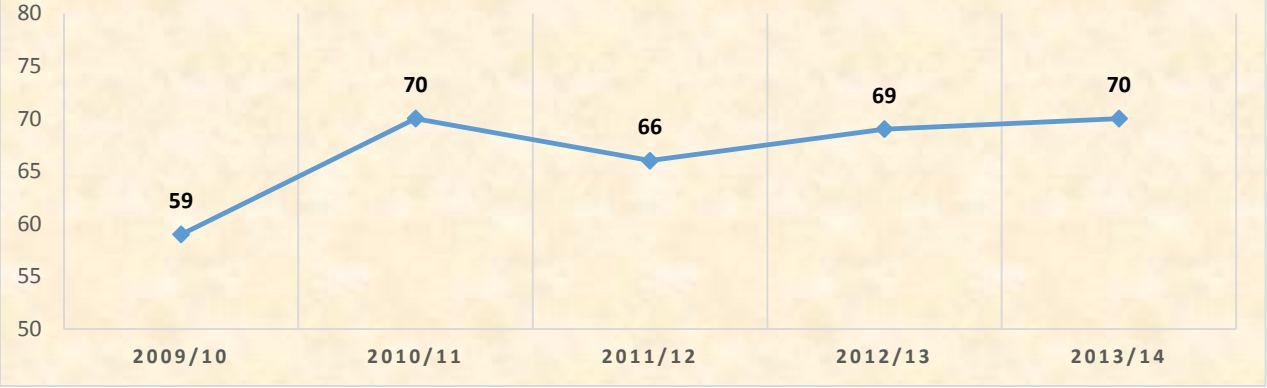
This indicator serves as a proxy of the University's internal research support and its investment in research and development activities. Over the four-year period the smallest proportion of the University's expenditure was devoted to research activities, spending on research ranged from 7 per cent to 9 per cent during the period *(see Figure 7.5)*. The bulk of University spending was allotted to teaching activities.



Doctoral productivity

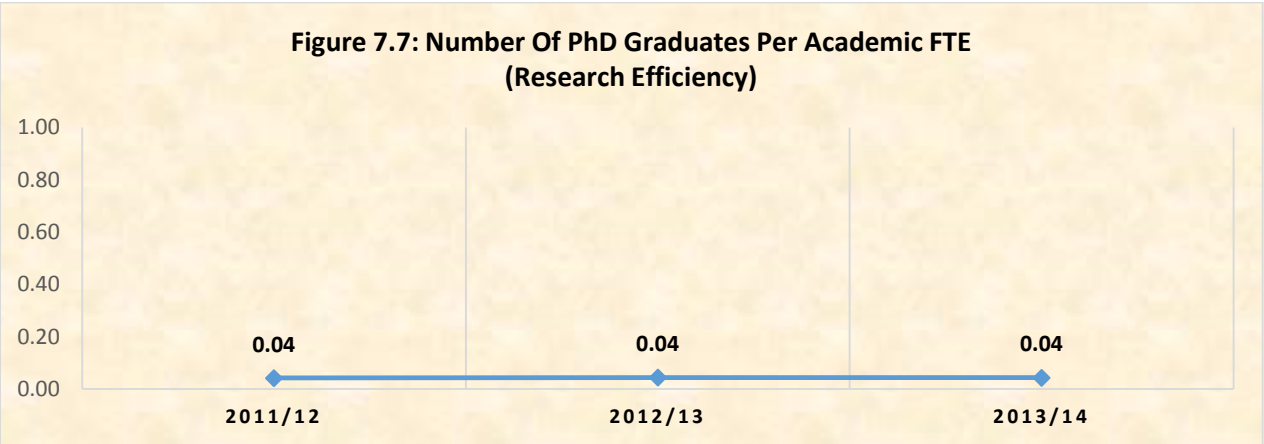
The number of doctorate degrees may also be seen as a representation of the research activity of an HEI and an expression of research effectiveness. Examining the number of doctoral degrees awarded in light of the number of FTE academic staff provides an indication of the efficiency of research activities at the UWI. The data show that the number of PhD degrees awarded by the UWI increased by 19 per cent from the period 2009/2010 to 2013/2014 *(see Figure 7.6)*. However, the number of PhDs produced remained on average at 0.04 for every FTE academic staff employed *(see Figure 7.7)*.

Figure 7.6: Number Of PhD Graduates (Research Effectiveness)



Source: U-Multirank submissions.

Figure 7.7: Number Of PhD Graduates Per Academic FTE (Research Efficiency)



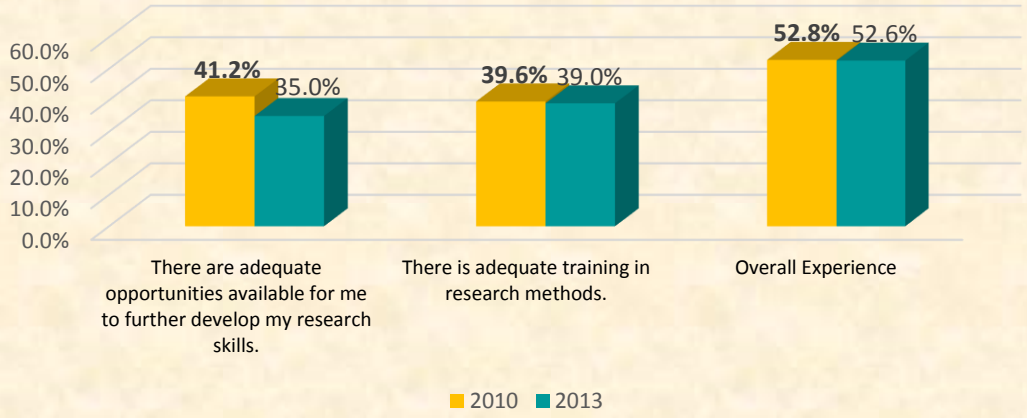
Source: U-Multirank submissions.

Enhancing graduate studies - postgraduates' satisfaction with research programme

Another indication of research effectiveness of the UWI is the level of satisfaction expressed by higher degree research students who are involved in research activities with academic staff. The PG-SES is an internal survey conducted every three years that asks students to rate aspects of their academic and non-academic post-graduate experience. Specific question items asked PhD candidates to assess aspects of their experience conducting research in addition to their overall experience while attending the University. Data solely on PhD students are presented in Figure 7.8 and the illustration presents the percentage of respondents who mostly or definitely agreed with the statements related to their research experience and those who were satisfied/very satisfied with their overall University experience (i.e. responses of 4 or 5 on the five-point scale).

For the 2010 and 2013 surveys, the percentage of doctoral students who mostly or definitely agreed with the statement "There are adequate opportunities available for me to further develop my research skills" moved from 35 per cent in 2010 to 41 per cent in 2013. Similarly, approximately 40 per cent of students surveyed believed they received adequate training in research methods. Just over half of participants stated they were satisfied or very satisfied with their overall experience at the UWI in both periods.

Figure 7.8: Percentage of Mostly Agree/Definitely Agree and Satisfied/Very Satisfied responses (PG-SES 2010 and 2013)



Source: PG-SES, 2010 and 2013.

7.3. External Benchmarking

In order to further assess the research productivity and performance of the UWI, comparisons or benchmarks are needed to help place UWI's research performance in perspective against a specific group of HEIs. A key element of benchmarking is the identification of institutions with similar institutional characteristics (peer institutions) and also the identification of apex institutions that achieve high levels of performance. Institutions which surpass the UWI can serve as examples of "best practice". Hence, the analysis, assessment and implementation of the methods and the higher performing HEIs will lead the UWI to achieve more efficient processes and ultimately higher levels of performance. In addition, examining the performance of peer institutions can lead to realistic target setting processes for University goals.

Peer institutions were selected using the UMR's University comparison tool *(see Box 7.1).*[14] Institutional peers were selected based on seven factors:

i. Scope (Comprehensive)
ii. Level of Study (Doctorate)
iii. Size of institution (Very Large)
iv. Legal status (Public)
v. Age of institution (1945-1980)
vi. Region (Latin America and Africa and Asia)
vii. IMF country classification (Emerging and Developing economies).[15]

[14] See U-Multirank. "Compare similar universities or start with a university." U-MUltirank 2015. http://www.umultirank.org/#!/compare?trackType=compare&sightMode=undefined.

[15] International Monetary Fund. "World Economic Outlook -Database—WEO Groups and Aggregates Information Country Composition of WEO Group." IMF, October 2015. https://www.imf.org/external/pubs/ft/weo/2015/02/weodata/groups.htm.

Box 7.2: What is U-Multirank?

U-Mulitrank (UMR) is a user-driven, multidimensional, world ranking of universities and colleges covering many aspects of higher education: research, teaching and learning, international orientation, knowledge transfer and regional engagement. Over 1200 higher education institutions, 1,800 faculties, and 7,500 study programmes from more than 80 countries have participated in this world ranking. The UWI has participated in both the institutional and field-based ranking since its start in 2014.

Harvard University, the National University of Singapore, the University of Cape Town and the University of Oxford consistently rank among the top international institutions both on overall ratings as well as research performance. These universities were selected as aspirational institutions for comparisons *(see Table 7.4)*. The University of Las Palmas de Gran Canaria and the University of Malta were also included for comparison as these institutions and the UWI are members of the University Consortium of Small Island States (UCSIS).

The UWI was compared to aspirational and peer institutions on the following research indicators:

- Number of research publications;
- Number of research publications corrected for size of institution;
- Citation rate;
- Number of patents awarded; and
- Number of patents awarded corrected for size of institution.

7.3.1. Research Publications and Citation Rate

As mentioned earlier in this section, the number of research publications provides insight on the research output of a university, while the citation rate shows the average number of times these publications are cited in other research and is a gauge of the impact of a university's research output. Not surprisingly, the aspirational institutions earned "A" and "B" grades on each of these indicators *(see Table 7.)*. Of the peer institutions selected for comparison, the University of Putra Malaysia earned "A" grades for the number of publications produced and also when the number of publications were corrected for the size of the institution. The Universiti Sains Malaysia also received "A" grades for the publication indicators. UCSIS member institutions included in the comparisons received "C" grades for the number of publications produced and outperformed the UWI's publication rate. However, once the institution size adjustment was applied, the UWI was on par with the UCSIS institutions and peer institutions in Brazil and Ghana. The citation rate of the research produced by the UWI also received a below average rating, but this rating is on par with most of the peer institutions and the UCSIS universities.

7.3.2. Patents

Examining the number of patents awarded to members of the University is another measure of research output. This measure assists with determining levels of inventive activity at the University and also serves as an indication of knowledge transfer i.e. the degree to which the University's discoveries and inventions are assigned to economic and/or commercial agents for further development.

The University of Putra Malaysia earned an "A" for the number of patents awarded and a "B" grade when the institution size correction was applied. The UWI received a below average rating on the number of patents awarded but the UWI performed better than on this indicator compared to the Ain Shams

University, the Kwame Nkrumah University of Science and Technology and the University of las Palmas de Gran Canaria.

7.4. The *UWI Strategic Plan 2012-2017*

With specific regards to the *Strategic/Operational Plan,* several initiatives were identified to advance the Perspective, 'Research and Innovation'. Based upon an analysis of the strategic objectives-to-strategic initiatives, the following completed initiatives were identified from Campus/Vice Chancellery reports submitted in March, 2016.

- Increase the number of research projects and publications (Open Campus);
- Develop Faculty of Science and Technogym Publication Policy (St Augustine); and
- Campus Coordinators to be part of follow-up process of Quality Assurance Review recommendations to departments re graduate studies (Vice Chancellery).

The Mona Campus identified the following initiatives as ongoing to be completed within the planning timeframe (2017):

- There was the production of a report on research productivity output for academic staff 2013-20114; and
- Work also commenced on the establishment of a database on patents.

5.4. Conclusion

That being said, the UWIs publication rate has been stable over the period *(Figure 7.1)* and is similar to selected peer institutions after the size of the institution is corrected *(see Table 7.4).* This finding however does not negate the need to improve the research productivity of the University, the UWI received a below average rating on these indicators and the data shows that each FTE academic staff produces about one publication per year *(see Figure 7.2).*

Other measures further support the University's need to improve its research productivity, the ratio of doctoral graduates to FTE academic staff is extremely low. Increasing the number of doctoral candidates and graduates should theoretically increase the level of the University's research activity. The research experience of these doctoral students also needs redress, less than half of doctoral candidates believed the UWI provided adequate research training and opportunities to develop their research skills *(see Figure 7.8).*

The UWI needs to improve both the quantity and quality of its research publications. In order to achieve this goal further investment in research activities is needed, findings show that less than 10 per cent of University spending is devoted to funding research activities while more than half of the University's budget is spent on teaching activities *(see Figure 5.8).* This disproportionate allocation of resources has contributed to the low performance of research and innovative functions at the UWI.

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CHAPTER EIGHT: CONCLUSION AND RECOMMENDATIONS

This chapter provides a summary of the findings of previous chapters by identifying areas of productivity improvements and also sets out recommendations for practice and policy.

8.1. Summary of chapters

This second edition of the *HESR* considered the notions of productivity and performance in the UWI drawing upon discourse in the area with particular reference to the higher education sector. Using that as a guide the *Report* framed its productivity and performance argument on examining efficiency and effectiveness of the UWI's products and services. Using existing University datasets, this *Report* showed the extent of efficiency and effectiveness in key areas: financial, administrative, teaching/learning and research. While noting that these productivity and performance indices can be used to provide measurable progress with operational effectiveness and efficiencies and useful productivity information to support institutional benchmarking (UK Universities 2011, 34). By considering issues of productivity and performance, useful information for the monitoring of the *UWI Strategic Plan, 2012-2017* was developed. It is worth noting that indicators used for all sections of this *Report* were informed by data availability and was thus somewhat limited.

As the University continues to battle with cash flow problems across the campuses, a result of the continued economic crisis prevailing in the UWI contributing countries, it is clear there is need for continuing aggressive efforts to raise revenues from non-traditional sources complemented by stringent cost containment measures. Based up the analysis of selected indicators some progress has been made in terms of reducing reliance on government and diversifying the funding base, however more needs to be done in reducing cost per student; further reducing reliance on public funding and increasing income from commercialisation, including research; and increasing externally funded special projects, primarily from international sources.

The efficient administration of university operations and services requires strategic leadership and management of human resources, systems, operational processes and policies to deliver on the operational effectiveness and productivity improvements. This also entails the implementation of administrative metrics to focus on efficiencies in operations, student and staff services, continuous process improvement, and employee engagement in all university administrative functions. Although there are challenges to assessing organisational effectiveness the UWI, the University has made significant efforts in their *Strategic Plan 2012-2017* to identify key administrative performance indicators which can be used to measure productivity in university administrative services. The results of the productivity analysis into administrative services have revealed that there is less than good employee engagement and process demands in the UWI and that the scores in the two BSC Perspectives of Employee Engagement and Development and Internal Operational Processes suggesting areas of weakness or developing weakness in overall performance.

Teaching, Learning and Student Development is the core business of the UWI and will always be a priority item requiring a significant proportion of the University resources. Enhancing productivity in this area is critical to producing a distinctive graduate equipped with the key attributes necessary for the modern workplace. The findings suggest there is scope for productivity enhancements in several areas namely; teaching and course quality; improving non-academic, social and physical services; improvements in throughput; and more efficient allocation of academic workload. The findings also point to a need to reconsider how resources can be best allocated to fill the gaps in the labour market and contributing to a

reduction in unemployment and underemployment of graduates. In addressing or improving these areas it would lead to greater efficiency and better effectiveness in a core of operations.

In considering the issue of quality from the perspective of teaching and learning, focus was given to the perspective of the quality of teaching from the student and employer. The stakeholders saw this element as strong. The UWI has developed a set of attributes that a graduate should acquire during his/her tenure at the University and which is critical to a work-ready graduate. The undergraduates gave this dimension a strong rating as did the postgraduates. Across the region, employers expressed varying levels of satisfaction with the general qualities and skills of the graduates. However, there was some concern expressed with the soft skills of the graduates. One indication of the quality of graduates produced by universities is the proportion of "Good Honours" degrees earned by the institution's graduates. For the period under consideration (2009/2010 to 2013/2014) approximately a third of all graduates earned Good Honours.

Universities as educational institutions are involved *inter alia* in knowledge creation, which also forms part of its mission. As such, they are generally engaged in expanding its research capacity and stimulating innovation so as to contribute to local and regional development and growing revenues that result from research activities. Based upon the data used from UMR, a ranking agency, the UWI's publication rate remained stable over four years and is similar to selected peer institutions after the size of the institution is corrected. However, the data shows that each FTE academic staff produces about one publication per year. The findings also suggest the need to improve doctoral productivity, which as a ratio of doctoral graduates to FTE academic staff is extremely low. Further, the research experience of doctoral students (and MPhils) as it relates to training and opportunities to develop their research skills need to be improved. In so doing, an opportunity exists where the research student can be encouraged to publish their work that would improve the research standing of the UWI, but also provide the research student with greater sense of confidence in their work and acceptance by the international academic community. Ultimately, there is need to improve the research productivity and performance both in terms of quantity and quality of its research publications and devote more spending to research activities.

8.2. Recommendations

To address productivity improvements, the following recommendations are made based upon what the data has shown in relation to the areas of focus.

8.2.1. Enhance performance reporting/business intelligence

Overall, there is need to introduce a university-wide *Data Governance and Management Structure* which is seen as critical to the development of new policies and procedures and the introduction of systems and processes for the production and the use of data. This has implications for evidence-based decision-making, provision of data to global ranking agencies, and monitoring of the *Strategic Plan*.

The UWI needs to improve its data collection by addressing deficiencies related to standardised data definitions and methodologies via the *development of an institutional data dictionary* for which a Working Group should be established comprising stakeholders from University and Campus Planning Offices, Quality Assurance Units, IT offices, Registry and Bursary. The findings of the *Institutional Data Needs Survey* of 2014 also provides an excellent starting point for developing the data dictionary.

The UWI should consider publishing an annual productivity and performance reports determined by the goals that need to be measured. A set of core indicators which would include a set of administrative, teaching/learning and research metrics that can support more in-depth analysis of efficiencies and

effectiveness should be identified. Again, the findings of the *Institutional Data Needs Survey* of 2014 also provides an excellent starting point Campuses and Faculty are encouraged to provide annually data that capture peer-reviewed publications by staff and research students, citations, patents filed, external research income and research expenditure. There is also need for regular Faculty Workload Studies, and throughput and retention studies.

The University needs to support systematic institutional benchmarking by identifying criteria for the selection of peer and aspirational HEIs that would place the UWI's performance in context against a select group of HEIs and drive effectiveness and efficiency based upon best or promising practices. It also supports greater accountability and transparency of the UWI's performance.

8.2.2. Financial Productivity and Performance

Productivity issue # 1: Reduce reliance on government funding

Campuses should continue to reduce reliance on government, particularly those campuses that are still above 50 per cent. Strategies are already outlined in the *Financial Perspective of the UWI Strategic Plan 2012-2017.*

Productivity issue # 2: Diversifying and expanding the revenue base

The University needs to continue to diversify and strengthen its funding base. Overall, there is significant scope for increasing income from commercial operations, inclusive of research commercialisation. There is differential progress and weaknesses across campuses e.g. the St Augustine and Cave Hill Campuses share of revenue generation from commercial operations and tuition fees are lower than other campuses.

Productivity issue 3: Improving external funding for projects per FT Academic Staff

It is critically important the University continue to significantly expand in this area and the productivity per FT academic staff be enhanced. Closer links with industry and a greater focus on globalisation with emphasis on international partnerships and other institutional Memoranda of Understanding (MOUs) should be a priority

Productivity issue # 4: Reducing Per Capita cost per FTE Student

The University must continuously strive to reduce cost per FTE student since this flags issues of cost efficiency and effectiveness within the system. Also higher per capita cost imply higher tuition fees and an additional cost burden to students as well as the state. Two main strategies can be held out as possible solutions and done simultaneously, one is to increase revenues and the other is cost containment.

8.2.3. Administrative Productivity and Performance

A university-wide policy framework for productivity and continuous improvement is urgently required and must be developed to ensure greater efficiencies in the administrative and operational management of the UWI.

The UWI administrative services goals and strategies, delineated in the existing *Strategic Plan*, should be wholly adopted, with the main objective to transform and modernise the overall management of university operations, which will improve the quality of services to all of its stakeholders.

Employee Engagement and Development

Productivity issue # 1: Competency-based Development

The University needs to improve leadership and management capabilities and job competencies of all employees so that they can effectively fulfil their roles

Productivity issue #2: Culture of Employee Engagement
The University needs to create an organisational environment that promotes personal growth and development for employees and positive cognitive, emotional and behavioural states directed toward optimum organisational outcomes

Productivity issue # 3: Strengthening Performance Management Systems
The University needs to improve, upgrade and align all human resource, enterprise, data and other management Systems into one system platform with accepted risk management

Internal Operational Processes
Productivity issue # 1: Efficient and Effective Academic and Administrative Processes
The UWI needs to implement improved data collection strategies and to collect more current data on costs and benefits of administrative operational functions so that a comprehensive analysis can be conducted. As such, administrative and economic metrics should be developed by the relevant departments of the UWI with accompanying measurable indicators to determine administrative benchmarking. There also needs for greater responsiveness to stakeholders.

Productivity issue # 2: Governance Arrangements
The university needs to integrate improved governance systems into the UWI's overall internal processes to enhance operational efficiencies at all levels of management. Attention is drawn to the recommendations contained in the *Report of the Chancellor's Commission on the Governance of the UWI (1994),* the *Report of the Chancellor' Task Force on Governance of the UWI (2004),* and the *Report of the One UWI Task Force (2016)*

Productivity issue # 3: Management Structures
The University needs to improve the effectiveness of executive and senior management structures at campus and University levels by introducing accountability and performance measurement

*8.*2.3. Teaching, Learning and Student Development Productivity and Performance
Productivity Issue #1: Student satisfaction with Academic quality and academic related services
Satisfaction surveys conducted suggest that there is scope for improvement in teaching and course quality, and in particular with academic advising and access to lecturers, suggesting that productivity of academic staff in this area is lacking. A number of factors may be responsible for this including high staff workload, lack of policy and, large class sizes and further investigation needs to be done in this area

Productivity Issue #2: Student satisfaction with Academic quality and academic related services
The overall student experience needs to be enhanced by improving non-academic, social and physical services, in particular, health services, career guidance and placement, security, recreational facilities and transport.

Productivity issue # 3: Employment rates of UWI Graduates
The UWI should consider reallocation of resources towards teaching in areas to fill gaps in the labour market that are in demand and are critical to development and/or aligned to the needs of the labour market and reduce areas where there is an apparent oversupply of graduates

Productivity issue # 4: Underemployment of graduates
It is clear that graduates are emerging into a hugely competitive job market where they may wait years before securing meaningful employment. Many young university graduates enter jobs that are not

commensurate with their qualifications (under-employment). It is no coincidence that most programmes with high unemployment rates also have high underemployment rates. This reinforces that issue of supply and demand as well as relevance and marketability of programmes

Productivity issue # 5: Employability of graduates – development of key attributes
Graduates feel that their entrepreneurial and innovative skills were not sufficiently developed and there is a need to create an Innovative and entrepreneurial culture that would enhance the levels of self-employment and stimulate economic activity. Graduates also feel that their IT and Information skills were not sufficiently developed and there is a need to close the technology gap in teaching, learning and research

Productivity issue # 6: Improving throughput rates
A recent study by the St Augustine Campus shows high levels non- completions, implying wastage of public resources apart from the human costs (financial and emotional) by students and their parents. Recent university-wide studies are not available, and the immediate need here is for all campuses to routinely conduct throughput studies. The UOPD has developed a common methodology which should be adopted by all campuses

8.2.4. Quality in Teaching and Learning
This concept is integral to teaching/learning and research noting the symbiotic relationship between these core functions. Various strategies are outlined in *UWI Strategic Plan 2012-2017* relating to academic quality. The *Task Force Report on Quality* (2016), the *Task Force Report on Quality* (2016) recommended *inter alia* the development of an overarching UWI Quality Policy that would articulate a UWI-wide integrated quality management system and establish a Quality Management Team. These may guide the development of the *UWI Strategic Plan 2017-2022.*

8.2.5. Research and Innovation Productivity and Performance
The results of the UMR ranking scheme clearly point to weaknesses in the research/citation/knowledge transfer area of UWI operations. It is therefore; imperative that the UWI accelerate the pace of implementation of the following strategies to address *Faculty-Led Research and Innovation:*

Productivity issue # 1: Tracking of University Research output
An annual comprehensive analysis of the research output of academic staff at the University and campus levels is needed in order to monitor University research output

Productivity issue # 2: Increase the number of peer-reviewed publications in regional journals
In order to elevate the research output of the University, increased publication in regional journals so that these journals meet the requisite criteria for entry into international bibliometric databases and subsequent inclusion into international ranking agencies journal publication and citation metrics. Also, increase publications n international journals

Productivity issue # 3: Enhance the research culture among academic staff
Encourage greater academic staff participation in international fora (conference presentations, hosting of international conferences

Productivity issue # 4: Assess the research productivity of academic staff
A comprehensive University-wide exercise is needed in order to examine the proportion of time academic staff devote to research activities and to also assist with determining whether teaching and service responsibilities affect time allocated to research pursuits

Productivity issue # 5: Expand Entrepreneurship and innovation
Execute the recommendations in *Innovation at the University of the West Indies*. In particular, develop Industry / academic alignment strategies in order to strengthen relationships between the University and the industrial sector. Also, a review of the existing provisions of the UWI Policy on IP Management and Commercialisation is needed so as to build capacity in, and to provide better guidance to the University researchers and administrators on the commercialization of UWI technology

Productivity issue # 6: Increase research productivity of post-graduate students
Academic staff need to further encourage their post-graduate students to participate in research activities which could have a positive effect on the overall University research output. It is recommended that the recommendations captured in *Reshaping the Graduate Research Programme at UWI* should be considered for implementations, in particular, that:

- Each PhD students should publish at least one paper in a recognised refereed journal before the completion of their thesis
- Research programmes should include courses in *Research Methods* and *Research Ethics.*
- Build capacity for publications through workshops or webinars coordinated by the postgraduate student associations and the Office of Graduate Studies and Research;
- Increase opportunities for student engagement in faculty research (inter and cross- department); encourage joint publications and joint grant proposals between faculty and postgraduate students;
- Provide more opportunities for postgraduates to present their research at conferences both locally and internationally. Implement annual postgraduate symposia drawing audience from within the academy and outside of it

Productivity issue # 7: Funding and Partnerships
The University needs to increase the number and quantum of monies obtained from external grants for research. Doing so would increase the research profile and productivity of the University, in particular the UWI should:

- Advocate to contributing countries the establishment of Research and Innovation Fund linked to high impact research or industry needs linked to economic growth.
- Establish University-Private Sector-Government (UPG) partnerships for support of high impact research or sponsored research.

The recommendations relating to Research, Publication and Innovation contained in the One UWI Task Force Report (2016) is also noted which speaks to the establishing and implementing a regional network for research and innovation, and strengthening internal coherence as it also relates to research and innovation.

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