**INTELLECTUAL CAPITAL AND GOVERNANCE**

**SECTION 3**

# GOVERNANCE OF THE R&D PRODUCTIVITY AT THE RESEARCH INSTITUTION BASED ON SOCIO-DEMOGRAPHIC INDICATORS

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## Abstract

It has been noted that DUT has seen a steady increase in its research outputs publication for the period 2010 until now. However, responsible for this increase is the contribution of a few researchers since not all academic staff is involved in research. The study aimed to examine the extent to which socio demographic factors impact academics from publishing accredited outputs. It also seeks to highlight the important role of research management as a highly professional and dynamic activity that must constantly adapt to the changing environment within which universities operate. The findings of the research revealed that males with masters and doctoral degrees are the most involved in research activities. The paper will benefit the institution by enhancing institutional research management systems and practices, ensuring relevant policies are in place. Enable research management to deploy the institution's research resources optimally so as to curb over reliance on the limited institutional research budget.

**Keywords:** Productivity, Institution, Governance, Research Outputs, Socio-Demographic, Research Management

## 1. INTRODUCTION

The Durban University of Technology came into being, first as a result of a voluntary merger between ML Sultan Technikon (a Historical Disadvantaged Institution (HDI) with mainly Indian enrolments) and Technikon Natal (a Historically Advantaged Institution with mainly white enrolments). The institution at the time was named Durban Institute of Technology (DIT) and 3 years later name changed to that of a University of Technology HEQC Report (2008). Both these institutions were technikons, focused purely on their teaching function with limited research activity and without an established research culture prior to 2001.

Universities are recognized and ranked according to their research activities and not teaching only. Over the past ten years DUT's research outputs have been very low and their recent growth of 0.20 per academic staff member has not been able to reach the Department of Higher Education & Training (DHET) benchmark of 0.565 per academic staff member (DUT Research Outputs Report 2003-2010).

The decreasing government funding for Higher Education Institutions and increasing competitive allocation of research funding has made research output production a major requirement for academics as it assists with leveraging the institutions revenue Mutula (2009). Researchers who are able to secure their own research funds leverage the institution's limited institutional research budget by freeing up funds for supporting emerging researchers and developing capacity for the upcoming researchers.

In general the underperformance in research publications is influenced by a number of factors such as: Staff Postgraduate Qualifications, the academic staffs' preparedness to engage in research, Teaching loads, Institutional research culture and policy, Attracting of Masters and Doctoral students and Non-attainment of research targets by DUT academics. Socio demographic factors are also believed to impact research output productivity. Hence this study seeks to identify and examine staff socio demographic profiles in the publication of research outputs at DUT.

## 2. LITERATURE REVIEW

Post 1994, the government put in place a number of transformation oriented initiatives to give South African Higher Education a more congruent and single educational system in line with the country's democracy. According to Badat (2010) overall parts of South African higher education show strength and much promise with respect to knowledge production and dissemination, contributing to social equity, economic and social development and democracy and to the development needs of South African region and the African continent.

While this may be the case the literature review brought out a number of challenges that continue to face the Higher Education Institutions (HEIs) in the SADC region and in South Africa The South African HEIs face a challenge of a diminishing pool of senior academics, especially those that are most active in research. Their age profile according to the CHE Report (2009), IEASA (2009) & HESA (2011) is placed at above 50. The indication is that within a decade or so one-fifth (over 3000) of these permanent academic researchers will go into retirement. Numbered at 975 (32%) of these researchers are professors, 17% are associate professors. This means that South Africa will lose almost half of its highly experienced and qualified academics. Badat (2010) intimates that there is a critical urgency to produce a new generation of academics that is increasingly constituted by Blacks and women South Africans and possess the intellectual and academic capabilities related to teaching and learning, research and community engagement.

Salaries of academics are also cited as a reason for the internal brain drain by academics looking for better prospects. Internal brain drain is a domestic movement of highly skilled professionals from the professions they were originally trained to do to other occupations unrelated to their original training within the country for economic and non-economic reasons. This includes moon-lighting by academics which results in diversion of official work time in order to earn extra income Ishengoma (2007) and Yizengaw (2008).

Teferra and Altbach (2004), SARUA, (2009), Ndlovu (2012) and CHEC (2013) indicate that about a third of all permanent academic staff at South African universities currently hold PhD thus, are eligible to supervise at this level. It is this critical lack of capacity to supervise that leads to South African HEIs producing fewer postgraduate students and limited postgraduate studies being pursued by students. However, this is not only a South African challenge but the whole of Africa is affected by poor supervision capacity which hampers the growth of PhD training. Ndlovu (2012) further indicates that most of the supervisory capacity resides within traditional universities which would explain their top research publication record.

ASSAf (2010) and HESA proposal (2011) concur that only 12% of academics at Universities of Technology had PhDs compared to 30% at comprehensive universities and 41% at traditional universities. A need for UoTs to train and recruit supervisors is of great importance in order to ensure a steady stream of young and qualified researchers. HEIs are focusing their efforts on training existing staff instead of offering PhDs to student fresh from their degree as they believe the straight-out-of-college PhD pipeline will be manageable once there is more trained academic staff that is able to supervise research students as well as pursue their own research activities Ndlovu (2012).

Hemmings and Kay (2010) in their study of research self-efficacy, publication output and early career development found that only a few of the non-publishing academics had completed a doctoral study and that a substantial number of the non-publishing academics did not hold a qualification at master's level. This confirms a correlation between qualification and the ability of an academic to publish. As a result, they argue that a lack of proper qualification is a contributing factor for the vast majority of academics who are not able to publish.

The drop-out rate of current postgraduate students in the pipeline is also very high within South African HEIs. Crest (2010), indicates the drop-out rate is as high as 53% in humanities, 51% for business and management and 36% in science and technology. Compared to other countries, South Africa produces a significantly low number of PhDs. HESA (2011) indicates that in 2007 South Africa produced 23 doctoral graduates per million of population, compared to 43 by Brazil, 157 by South Korea and almost 200 by Australia. The national benchmark for doctoral graduation rate is 20% but the national average is only 11%. Academics are also faced with very high teaching loads and the unequal development of research culture amongst the HEIs.

The diversity in the world of work has become very rich in terms of race, culture, gender, age and in many other ways. Diversity in South Africa does not translate into fair representation of the demographics of the country especially in the HEIs where transformation is slow. Black South African researchers because of the history of apartheid that denied Africans opportunities to partake in certain positions are still underrepresented in institutions of Higher Education, Maboleka & Mawila (2004), Moleke (2005), Van der Walt & du Plessis (2010) and Badat, (2010).

Effective administration and management of research at HEIs has become a highly professional activity that requires an ability to decipher national policies and directives at the institutional level into meaningful opportunities for researchers Madue (2005), Tauginiene (2009) and Cele and Lekhanya (2014). Research outputs at the DUT grew steadily from 35.05 units in 2006 to 88.88 units in 2011, an increase of 154% over 5 years. There was a sudden drop of 25.8% from 2007 to 2008 (35.05 units to 26.20 units). This may have been caused by the merger between ML Sultan Technikon and Natal Technikon. Like other organizations, universities exist in a very dynamic and complex environment, where proactively managing changes rather than reacting decides who gets ahead.

### 2.1. Objectives

The objectives of this study are the following:

- To identify staff socio demographic profiles into the participation in Research publications at DUT
- To examine to what extent do the socio profile demographics influence the staff research publications performance.

## 3. METHODOLOGY

Data for this study was collected from the six faculties at DUT. A stratified sample which consisted of 60 respondents made up of emerging and experienced researchers. In order to collect primary data the Research questionnaire was formulated after reviewing major literature on research outputs. The questionnaire consisted of both open and close ended questionnaires. DUT's Research reports from the department of education and other government reports were reviewed to obtain secondary data for the study.

### 3.1. Target population

A research questionnaire was formulated and distributed to 60 academics, which were divided into two groups, 30 emerging and 30 experienced researchers. The study was limited only to DUT academic staff members using a purposive sampling.

### 3.2. Questionnaire administration

The questionnaires were sent to the respondents by email and they were given 10 days within which to complete and return the questionnaire. A total of 44 responses were received, 21 were from emerging researchers and 23 were from experienced researchers. 47.7% were received from female researchers while 52.3% was received from male researchers.

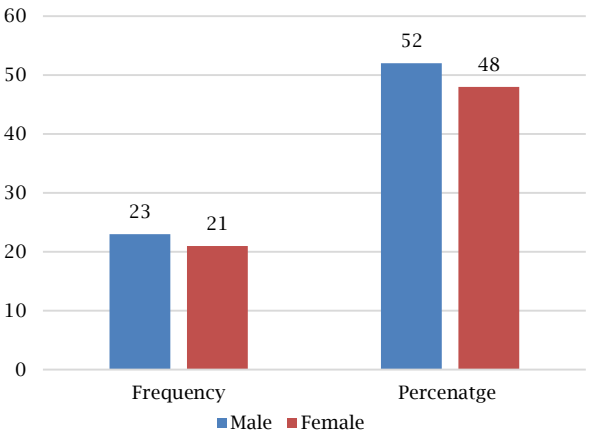
### 3.3. Analysis of data

Data was analyzed using statistical package software where the reliability of the results were tested.

## 4. FINDINGS

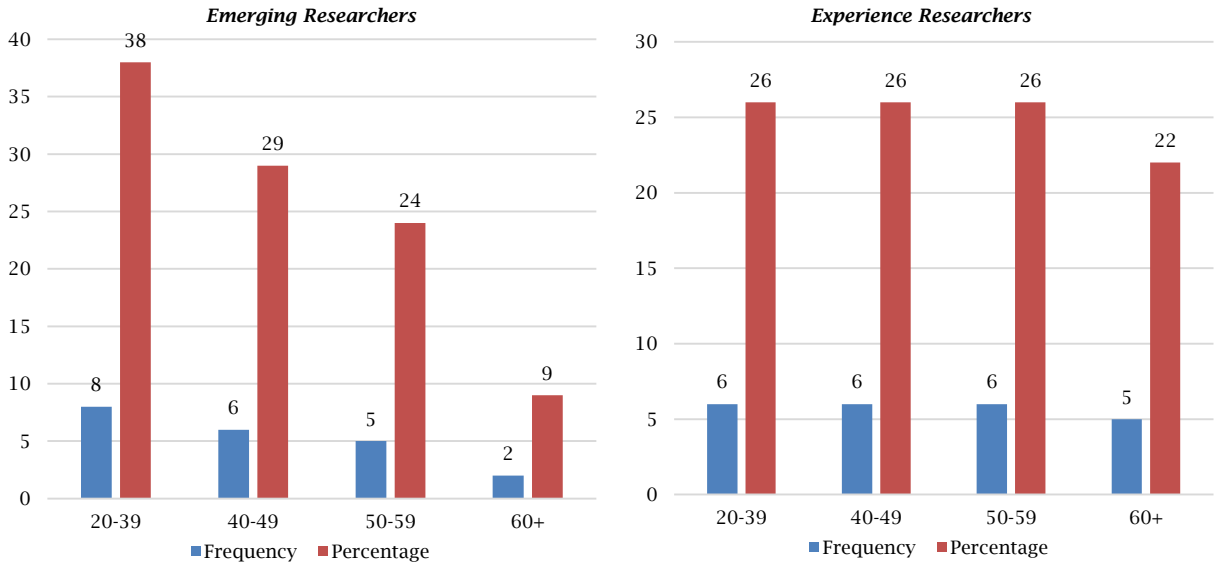
The sampling frame for this study was 60 respondents, which were divided into two groups of 30, as emerging and experienced researchers a total of 44 responses were received, 21 were from emerging researchers and 23 were from experienced researchers. 47.7% were received from female researchers while 52.3% was received from male researchers.

**Figure 1.** Respondents according to gender




The emerging researchers' responses in the age group of 20-39 were the highest at 38%, followed by 40-49 age-group at 29%. The responses from the age group 50-59 were third at 24% and the group age of 60 and above was fourth at 10%. For experienced researchers the responses in the age group 20-39, 40-49 and 50-59 were all at 26% while the age group of 60 and above, were at 22%. An indication from figure 2 is that experienced researchers are fairly distributed within all age groups. Emerging researchers are mainly represented within the 20-39 age group; this is to be expected as the researchers are young, upcoming and are just starting their research careers. Interestingly there are a few emerging researchers within the 60 and above age group, these may be late developers as a result of the historical environment from which DUT has arisen from (merging of two technikons).

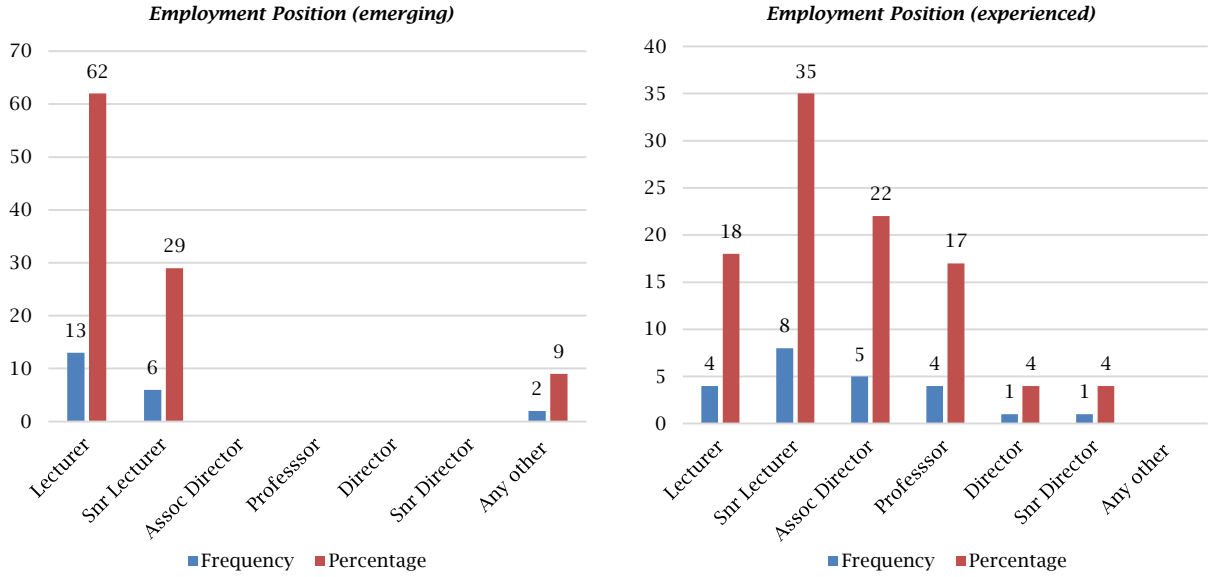
**Figure 2.** Respondents according to age



Of the emerging researchers that responded, 61.90% were Lecturers while 28.57% were Senior Lecturers; none (0%) of the emerging researchers were Associate Professors, Professors, Directors or Senior Directors, in terms of their employment positions. Of the experienced researchers, 17.39% were Lecturers, 34.78% were Senior Lecturers, 21.74% were Associate Professors, 17.39% were Professors, 4.35% were Directors and 4.35% were Senior Directors, which is an indication that experienced researchers are present at every level.

The Lecturer position occupied by most emerging researchers. Experienced researchers are spread in all positions with Senior Lecturer being the mostly occupied position by experienced researchers followed by Associate Professor. This is consistent as the experienced researchers who have been in academia for longer are able to qualify for promotions to the top positions compared to emerging researchers who are young in terms of their academic career and therefore only occupying the two entry level positions only.

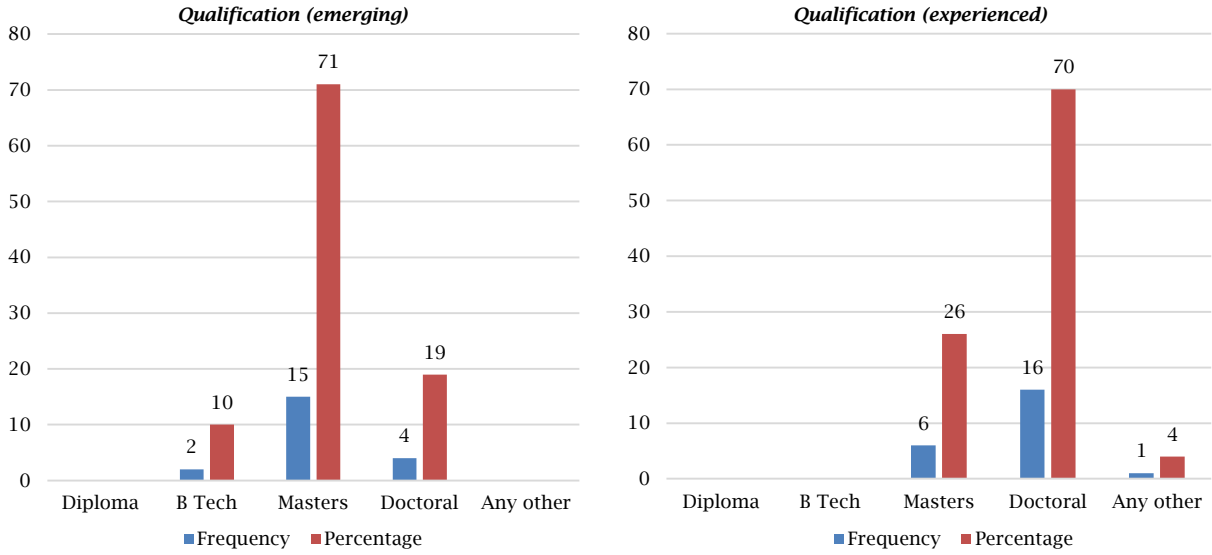
**Figure 3.** Respondents according to employment position




All researchers had at least a B Tech qualification or above. Of the emerging researchers 9.52% of the respondents had a B Tech degree and 7.43% had a master's while 19.05% had doctorates. Of the experienced researchers 26.09% had a master's and 69.27% had doctorates.

This indicates that the Durban University of Technology's academic staff members are pursuing higher qualifications which are required for holding an academic position in a UoT. More staff now have, masters for emerging researchers and also there are more experienced researchers with doctorates. It is apparent from the responses that experienced researchers' qualification is mainly a doctoral degree.

**Figure 4.** Respondents according to qualifications



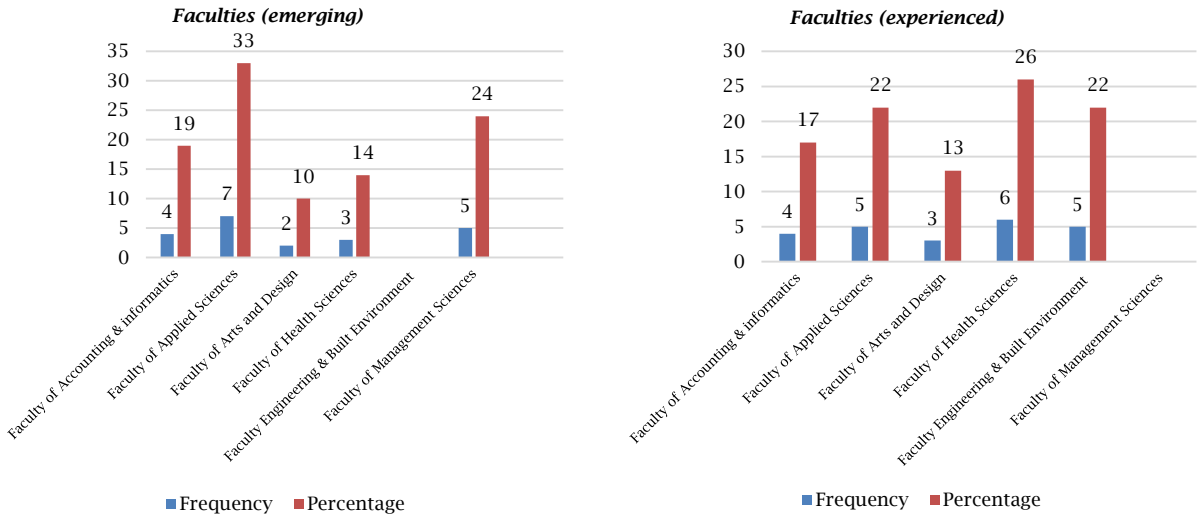

The Faculty of Accounting informatics had 0% from both group of respondents, Faculty of Arts and Design had 33.33% respondents from emerging researchers and 21.74% from experienced

researchers. Faculty of Health Sciences had 26.09% from experienced researchers and 14.28% from emerging researchers, Faculty of Applied Sciences with 19.05% from emerging researchers and 17.39% from experienced researchers, the Faculty of Engineering and the Built Environment had 9.52% from emerging researchers and 13.04% from experienced researchers.

Overall the Faculty of Arts and Design had a high response of 27.27%, the Faculty of Management Sciences had 22.72% responses, the Faculty of Health Sciences had 20.45% responses, the Faculty of Applied Sciences had 18.18%, and Faculty of Engineering had 11.36% and the Faculty of Accounting and informatics with 0% response.

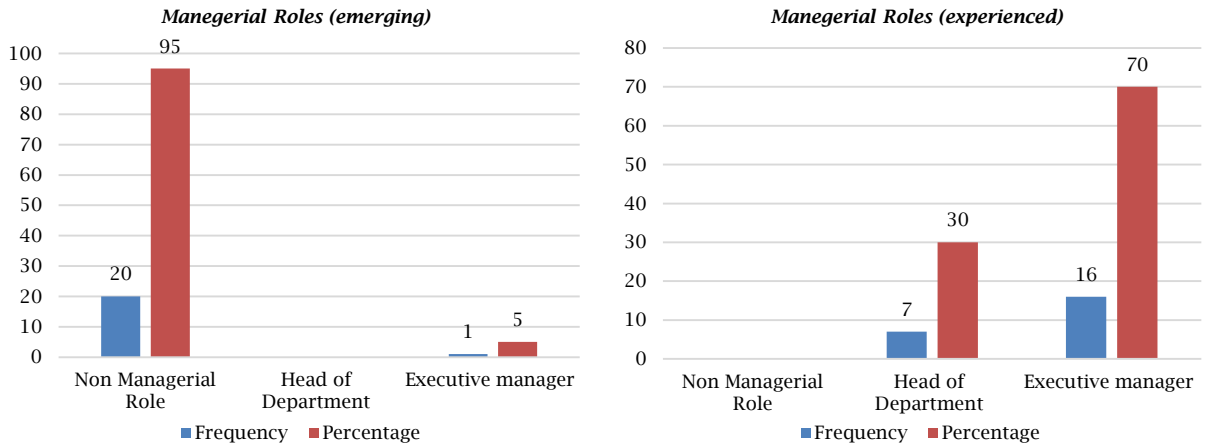
It must be noted that the Faculty of Accounting and Informatics' response of 0% respondents may be explained by the poor research output performance of the faculty as is evident from the 2009 to 2011 which totaled 11 units for a period of three years. While the Faculty of Arts and Design also has low outputs of 9 units over the same period they do produce many creative outputs which are unfortunately not weighted. Research is undertaken at all six faculties but at different levels and also it is evident that different faculties have different amounts of outputs and the number of researchers which then impacts their response rate.

**Figure 5.** Respondents according to faculty




The emerging researchers formed 95.23% of the researchers that were neither Heads of Departments nor Executive Managers while only 4.76% were in managerial positions. Of experienced researchers 30% were in Executive Management positions while 30% were Heads of Departments. Most of the emerging researchers do not hold any managerial positions as these are researchers who are just starting out their academic careers. These managerial positions are mainly held by experienced researchers this is to be expected as it is consistent with their qualifications and experience in the academic field.

**Figure 6.** Respondents according to managerial roles



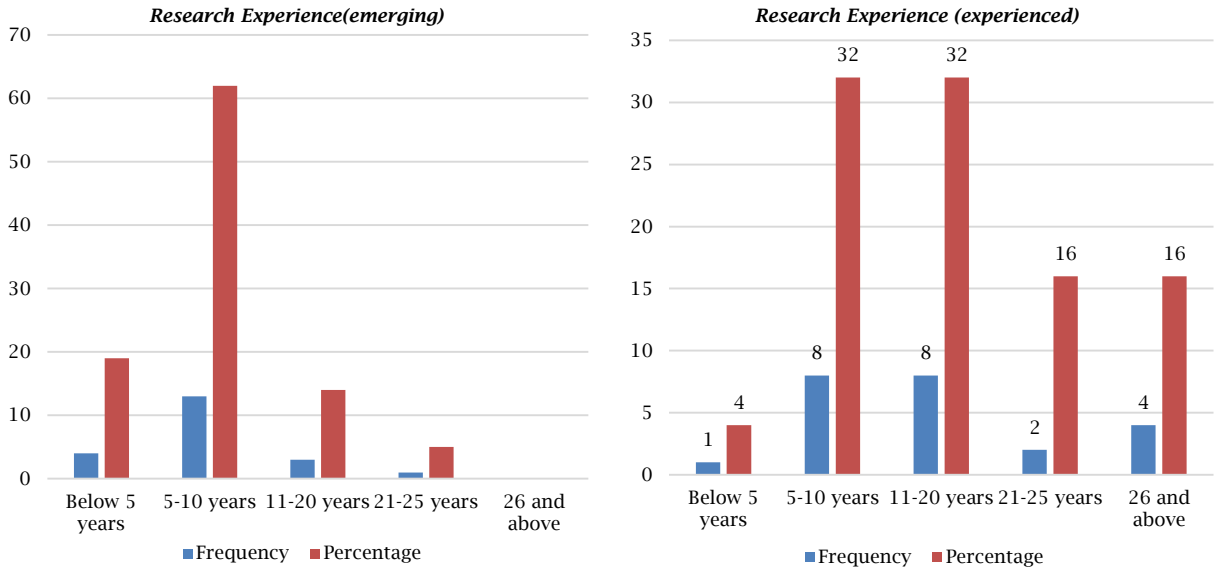

Emerging researchers with less than five years of research experience were 20% and the most of emerging researchers were within the 5-10 year group, in the 11-20 year group were 14.28% while there were very few at 4.76% within the 21-25 group and there was 0% of emerging researchers for the group of 26 years and above in terms of research experience.

Most of the emerging researchers' experience range from below 5 years to 20 years and only a few at 4.76% beyond the 20 year range. Experienced researchers dominate at the 5-10 year range up to

the 26-and above range with very few below 5 years. Emerging researchers dominate the first two age ranges from the lowest which is below 5 years to 5-10 years. This would be as a result of the amount of experience and the age levels of each group.

It seems that experienced researchers are evenly distributed mostly in the group of 5-10 years and 11-years at 34.78% followed by a group within 26 years and above at 17.39%. There were very few experienced researchers in the group of 5 years and below.

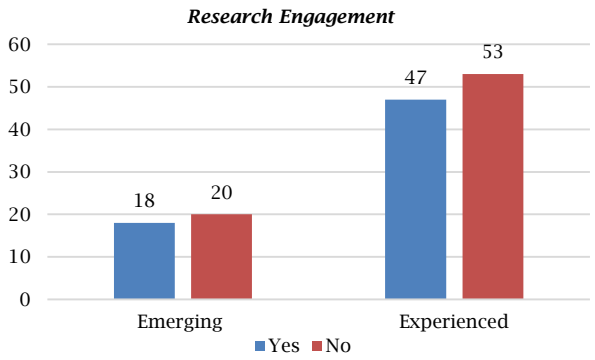
**Figure 7.** Respondents according to research experience




The emerging researchers indicated that 18.47% are involved in doing research beyond their qualifications and 20.53% indicated that they only do research to improve their qualifications because of time constraint and the need to recuperate after obtaining their qualifications. Of the experienced researchers 53% indicated that they are involved in research even after obtaining their qualifications and 47% were not undertaking any research at the time.

Most researchers from both the emerging and experienced researcher group at DUT are undertaking research as a part of their other academic activities, but there are some academic staff members who are not undertaking research after having received their higher qualifications citing various reasons such as time constraint and needing time to recuperate after obtaining their qualifications.

**Figure 8.** Do you ever do research other than when studying for a higher qualification?




### 4.1. Limitations

A study using a larger sample of all the 577 academic staff members at DUT in order to obtain their perceptions would be necessary before the institution decides to embark on any policy changes, to establish and confirm the factors that identified in this study and to improve DUT's research output levels and enhance revenue from research activities.

A larger sample will enable better collection and analysis of data according to faculties, field of study, gender and work experience to yield richer findings as a result produce findings that can be generalized as probability sampling method ensures that the results of the research are seen to be biased. Findings of this study were limited by the study's exploratory nature and small sample. Further research using a larger sample and taking into consideration other UoTs is recommended.

### 4.2. Implications of the study

The study was significant in that it aims to improve the research performance and outputs at DUT, with the ultimate goal to serve the broader university landscape in South Africa. The study is important to address underperformance and to position DUT as a truly UoT as per the benchmarks set by DHET. To alert research managers to the fact that research management requires fore-thought so that institutional research agenda matches the national agenda. Further research may look at the framework that emerging universities such as UoTs can follow in their quest to enhance their research development endeavors.

## 5. CONCLUSION

### 5.1. Recommendations based on the conclusion of the study

There is an apparent underrepresentation of South African Black, Young and Female Researchers in

addressing historical imbalances as envisaged by the DHET. The office in charge of research may introduce interventions and strategies to develop and balance the demographic profiles of previously disadvantaged individuals.

The institution must also look into the three factors that were identified during this study such as the issues of, research incentives, sabbatical leave for researchers and lecturer load replacement. The additional areas that were flagged by researchers as a result of the survey for this study relate to DUT policy and therefore would require careful consideration before any policy changes can be instituted.

Those charged with management and administration of research at DUT need to be creative in how they deal with the inadequate budget allocated for research activities. Inadequate funding for research activities requires that instituted interventions are sustainable, that priority is given to strategic research areas, that capacity development activities are tailored according to the needs of faculties and academics to ensure that they are effective. Institutional internal funding is crucial in supporting and encouraging emerging researchers to develop their research track record enabling them to attract external funding and decrease their level of reliance on limited institutional research budget. Despite these obstacles, most researchers indicated that they are undertaking their research activities with all other academic activities, administrative, managerial and executive workloads. Low research outputs results in a financial loss for the university and the researchers themselves. This means that many academic staff members rely on internal institutional research funding as they are unable to publish their own research. These academics are unable to receive the research rewards money from the DHET that would enable them to build their research track record.

Empowerment of research support staff is of importance if they are to play a meaningful role in supporting researchers. Their research knowledge needs to be relevant and in depth so that they are able to offer professional expert advice on research issues such as proposal writing, budgeting for research, contribute to the research policy and framework of DUT. The research support staff should also be enabled to assist researchers in identifying external funding sources and bring to the attention of relevant research groups information that is tailored to save the researchers time. This would assist also in encouraging groups of researchers when opportunities are pointed out and offer for support visible to the researchers.

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