


THE DRIVERS OF INNOVATION AT UNIVERSITIES: A CASE OF SOUTH AFRICAN UNIVERSITIES

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ARTICLE INFO	ABSTRACT
<p>Article history:</p> <p>Received 22 May 2023</p> <p>Accepted 18 August 2023</p>	<p>Purpose: The study is aimed to contribute to an understanding of the drivers of innovation that lead to practical solutions at South African Universities.</p>
<p>Keywords:</p> <p>Innovation; Universities; Competitive Advantage; Sustainability; Practical Solutions; Employees; Leadership.</p>	<p>Theoretical Framework: This article borrows from both Institutional Theory and organizational Theory’s perspectives on innovation. Those theories are crucial in exploring the views of employees and leaders on what they deemed to be drivers of innovation at their respective universities with the view to suggest a sustainable conceptual model for public universities’ innovativeness.</p>
	<p>Design/methodology/approach: A mixed method approach was adopted, entailing an online survey and semi-structured interviews, to explore innovation from both an employee's and senior leaders' perspective. The population for the study included employees from two Universities, and random sampling and purposive sampling were applied respectively, for the survey and semi-structured interviews. Survey data were analysed using SPSS and semi-structured interviews data were analysed using Nvivo 12.</p>
	<p>Results: Several drivers for innovation were found, including the need to respond to societal challenges, the drive for collaborative knowledge exchange, global rankings, individual employee drive, a nurturing environment, leadership, students, and government.</p>
	<p>Research, Practical & Social implications: Careful reflections must be entered into by all relevant internal and external stakeholders (see figure 1) so that Universities can define the scope of innovation they wish to pursue based on their resources and contexts since Universities differ.</p>
	<p>Originality/value: The original contribution to knowledge of this study lies in the suggested conceptual model for South African universities as they position themselves to innovatively address local and global socio-economic challenges.</p>
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OS MOTORES DA INOVAÇÃO NAS UNIVERSIDADES: UM CASO DE UNIVERSIDADES SUL-AFRICANAS

RESUMO

Objetivo: O estudo tem como objetivo contribuir para a compreensão dos impulsionadores da inovação que levam a soluções práticas nas universidades sul-africanas.

Estrutura Teórica: Este artigo toma emprestado das perspectivas tanto da Teoria Institucional quanto da Teoria Organizacional sobre inovação. Essas teorias são cruciais para explorar os pontos de vista de funcionários e líderes

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sobre o que eles consideraram ser motores de inovação em suas respectivas universidades com o objetivo de sugerir um modelo conceitual sustentável para a inovação das universidades públicas.

Design/metodologia/abordagem: Foi adotada uma abordagem de método misto, que envolve uma pesquisa on-line e entrevistas semiestruturadas, para explorar a inovação a partir da perspectiva de um funcionário e de líderes sênior. A população para o estudo incluiu funcionários de duas Universidades, e amostragem aleatória e amostragem intensiva foram aplicadas, respectivamente, para a pesquisa e entrevistas semiestruturadas. Os dados do levantamento foram analisados por meio de SPSS e os dados de entrevistas semiestruturadas foram analisados por meio de Nvivo 12.

Resultados: Foram encontrados vários impulsionadores para a inovação, incluindo a necessidade de responder aos desafios societários, o impulso para o intercâmbio de conhecimento colaborativo, rankings globais, unidade individual dos funcionários, um ambiente acolhedor, liderança, estudantes e governo.

Investigação, implicações práticas e sociais: todas as partes interessadas relevantes, tanto internas como externas, devem realizar reflexões cuidadosas (ver figura 1) para que as universidades possam definir o âmbito de inovação que desejam prosseguir com base nos seus recursos e contextos, uma vez que as universidades diferem.

Originalidade/valor: A contribuição original para o conhecimento deste estudo está no modelo conceitual sugerido para as universidades sul-africanas, uma vez que elas se posicionam para enfrentar de forma inovadora os desafios socioeconômicos locais e globais.

Palavras-chave: Inovação, Universidades, Vantagem Competitiva, Sustentabilidade, Soluções Práticas, Funcionários, Liderança.

LOS MOTORES DE LA INNOVACIÓN EN LAS UNIVERSIDADES: UN CASO DE LAS UNIVERSIDADES SUDAFRICANAS

RESUMEN

Finalidad: El estudio pretende contribuir a la comprensión de los motores de innovación que conducen a soluciones prácticas en las universidades sudafricanas.

Marco Teórico: Este artículo toma como punto de partida tanto la Teoría Institucional como la Teoría Organizacional en materia de innovación. Estas teorías son cruciales para explorar las opiniones de los empleados y líderes sobre lo que consideran motores de innovación en sus respectivas universidades con el fin de sugerir un modelo conceptual sostenible para la innovación de las universidades públicas.

Diseño/metodología/enfoque: Se adoptó un enfoque de método mixto, que incluyó una encuesta en línea y entrevistas semiestruturadas, para explorar la innovación desde la perspectiva de los empleados y de los altos directivos. La población para el estudio incluyó empleados de dos universidades, y se aplicó muestreo aleatorio y muestreo intencional respectivamente, para la encuesta y entrevistas semiestruturadas. Los datos de la encuesta se analizaron mediante SPSS y los datos de las entrevistas semiestruturadas se analizaron mediante Nvivo 12.

Resultados: Se encontraron varios motores para la innovación, incluyendo la necesidad de responder a los desafíos de la sociedad, el impulso para el intercambio de conocimiento colaborativo, clasificaciones globales, impulso individual de los empleados, un entorno propicio, liderazgo, estudiantes y gobierno.

Implicaciones prácticas, sociales y de investigación: Todas las partes interesadas pertinentes, tanto internas como externas, deben reflexionar detenidamente (véase la figura 1) para que las universidades puedan definir el alcance de la innovación que desean perseguir en función de sus recursos y contextos, ya que las universidades difieren.

Originalidad/valor: La contribución original al conocimiento de este estudio radica en el modelo conceptual sugerido para las universidades sudafricanas, ya que se posicionan para abordar de manera innovadora los desafíos socioeconómicos locales y globales.

Palabras clave: Innovación, Universidades, Ventaja Competitiva, Sostenibilidad, Soluciones Prácticas, Empleados, Liderazgo.

INTRODUCTION

With Universities being key contributors to the production of knowledge, it is important to explore the extent to which their innovation activities contribute to practical solutions to the country's socio-economic challenges. Such a view is shared by Demircioglu and Van der Wal

(2022) who point out that “Public sector employees are increasingly expected to deliver more with less amid high stakeholder expectations and permanent austerity, pressuring them to innovate existing processes and services” (p.1298). Key university stakeholders are those internally (such as students and employees) and externally (such as funders and regulative bodies). Simms (2021) and Wipulanusat et al. (2020) corroborate Demircioglu and Van der Wal (2022) adding that innovation in public institutions requires employees (including leadership at lower and upper management) to not only break past practices but to rethink roles and values. Roles and values of all stakeholders (including university employees, students and external stakeholders) to maximize impact on all university key stakeholders.

This article borrows from both Institutional Theory and organizational Theory’s perspectives on innovation in public organizations/institutions. Institutional Theory’s regulative and cultural cognitive elements are key to understanding the roles and values of key stakeholders (Farisani 2023; Farisani 2022; Palthe, 2014; and Scott, 2013). Institutional Theory’s regulative element will be key in understanding the regulative impact of a key stakeholder which is the South African government's department of Higher Education. The cultural cognitive element will assist in understanding the values, beliefs and assumptions of key stakeholders of university stakeholders such as students and employees. Organizational Theory’s perspective will assist in understanding the focus of leadership at different levels within South African universities (Bryson, 2004; Van der Wal, 2017). Demircioglu and Van der Wal (2022) affirm and point out that “those in senior executive positions, may increasingly focus on politically incentivized, externally oriented innovations that emphasize stakeholder engagement and collaboration” while “Lower-level managers may pursue both internally and externally targeted innovation while being primarily responsible and accountable for improving the internal efficiency and performance of their teams and departments” (p.1290).

For Universities to be successful at innovation, clarity is required on how university employees define innovation, its benefits and their appetite for enhancing their innovation practices. It has been found that Universities are not always able to translate their research into practical usable innovations and solutions for the country’s benefit (Patra and Muchie, 2018). While studies have been conducted on innovation at Universities globally, there are limited South African studies on the drivers of innovation at South African Universities. The purpose of the study is to explore the views of employees and leaders on what they deemed to be drivers of innovation at their respective universities with the view to suggest a sustainable conceptual model for public universities’ innovativeness.

LITERATURE REVIEW

Drivers of Innovation

An understanding of what drives Universities to be innovative and factors that motivate and shape innovation efforts often determines their success or failure. Wipulanusat et al. (2019) posit that innovativeness in a public sector context (of which Universities are) is about the search for creative or novel solutions to problems and demands, new services, new organisational structures and improved processes. Both articles of Udin (2023) and Simms (2021) echoes Wipulanusat et al. (2019) pointing to the need for an innovation-enabling environment and drivers of innovation. The strength of competition, the threat of market entry and the speed of technological change are some of the drivers of innovation. Udin (2023) posit that organisations may not be able to leverage innovation without the development of a learning culture. Learning to meet specific societal challenges, which can be solved by developing new services, technologies, organisational structures, management approaches, governance processes and policy concepts (Wipulanusat et al., 2019). It is therefore clear that innovation that meets societal challenges will need to be informed by societal views. Understanding societal views are consistent with Institutional Theory's cultural cognitive element (Farisani 2023; Scott, 2013). Understanding societal views are also consistent with organizational Theory's perspective on the relationships between external and internal stakeholders in positioning public institutions to be innovative. Majeed and Kadhumb (2023) affirm and point out that "Both internally and externally of the company, useful ideas can be acquired".

Innovation can be radical or incremental and applied to products, processes, or services; and can happen at all levels, from management teams to departments to an individual (Baporikar, 2015). Baporikar (2015)'s view is shared by Demircioglu and Van der Wal (2022) who assert that every public employee has a role to play in the overall innovation of the institution/organization.

Innovation can be driven by the market (market pull); driven by technology (technology push) and Universities need to consider aspects of the higher education market and technology that propels them to innovate (Johnson et al., 2016). Johnson et al. (2016)'s perspective is consistent with Institutional Theory's regulative element. Scott (2013) asserts that regulations do impact institutions to drive them to behave in certain ways. Innovation at Universities seems to be driven by government regulations and expectations; which are closely tied to government subsidies e.g. terms of research publications, percentage of academics who hold a PhD, etc. Other aspects that possibly drive innovation at Universities include global rankings,

the evolving student calibre and third steam income needs. However, this may not necessarily be correct for what drives individual employees to be innovative. It would be interesting as part of this study to ascertain whether there is a correlation between what drives innovation at an institutional level and an individual level.

Owolabi et al. (2019) asserted that innovation is driven by four (4) factors, firstly, environmental concerns that influence, force and stimulate organizations to innovate. Secondly, technological knowledge, which enables organisations to develop innovative products and processes; thirdly, knowledge exchanges where sharing and collaborative arrangements facilitate innovation within and between organizations; and lastly boundary spanning where initiatives to co-innovate across the boundaries of departments, organizations and partnerships are facilitated. For Universities, boundary spanning may include co-innovation that spans nationally and globally. Customers/ clients are also said to influence innovation through their demands and expectations. Baporikar (2015) proposed that organisations must understand why the drivers are innovating as a precondition for success.

Driving innovation provides an opportunity for managers of both public and private organizations to develop, improve, and renew their organizations' positions in the market, the quality of their organizations' projects and drivers demands continuity and learning (Baporikar, 2015). Bossink (2004) argued that drivers create a sense of urgency to create new organizational goals and generate new ideas for meeting these goals. More so, because the disruptive changes nowadays are such that it is no longer sufficient to improve products and services to maintain a competitive edge but new ideas i.e. disruptive innovation achieves the competitive edge. Organisations are often operating at the edge of chaos and crises. Examining the drivers of innovation (Baporikar, 2015) outlined ten (10) drivers of innovation as per Figure 1.



Source: Baporikar (2015)

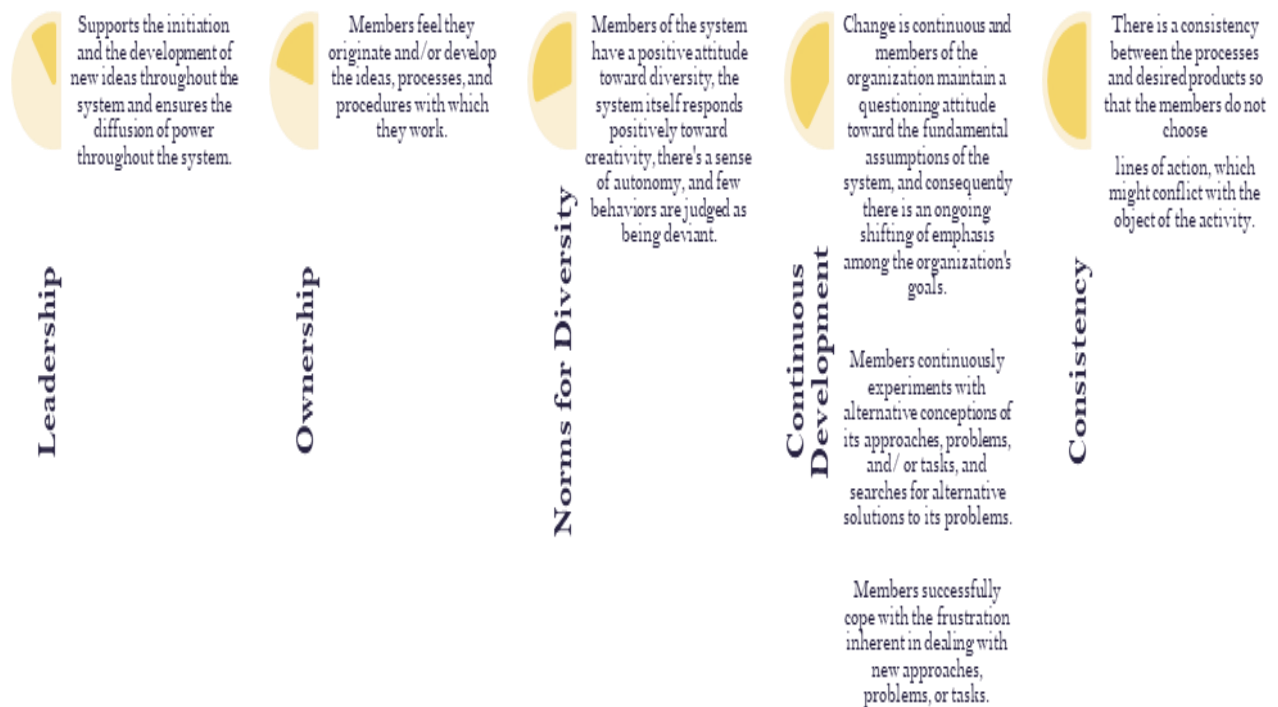
Indicators of Innovation

To understand and manage innovation as well as capitalise on it to gain a competitive edge, it is also important to understand how to measure it, especially in the knowledge economy where Universities are deemed as key contributors to research and innovation. What are indicators of innovation; how does an organisation know that they are innovative and how does a University know that they are innovative are questions to be answered if innovation is to be leveraged for the benefit of society and the economy.

There are several innovation indicators listed in the literature, namely, patent licensing and publications (Patra and Muchie, 2018); (Huanga and Chen, 2017). Other indicators include industry collaborations, research and development budget, human capital practices, innovation climate and learning culture, the existence of innovation strategy, joint publications, university spinoffs, rate of graduate employment, mutual secondments with industry partners, percentage third-stream income, a ratio of centres of excellence, number of employees responsible for finding industry partnerships and average number of start-ups. Universities' innovation management practices need to ensure that there are clear measures of success and there is a clear link to the strategic framework of innovation. The adage remains, which says, "*What gets measured gets managed.*" Therefore, goals, measurements and metrics are a key part of any innovation initiative (Baporikar, 2015) and they should be tied to strategic goals and compensation plans.

The commitment of senior executive management, compensation and measurements reinforce the culture of innovation. Indicators of innovation associated with Universities in South Africa include research publications, patents, industry partnerships, percentage third-stream income, graduate employability, entrepreneurship activities and the number of staff allocated to manage innovation endeavours. In a much earlier study aimed at validation of the Siegel Scale of Support for Innovation, Siegel and Kaemmerer (1978) found that innovativeness in organisations is indicated by five (5) dimensions as shown in Figure 2 below. These findings focus more on the people-related organisational indicators, which have been further corroborated by more recent studies.

Figure 2: Five dimensions characteristic of innovative organizations



Source: Siegel and Kaemmerer (1978)

The Siegel Scale of Support for Innovation provides a comprehensive framework for evaluating whether organisations support innovation and whether aspects of it are adaptable to the current study. Although it has been criticized because of its limited use in workplaces and there is little documentation on its psychometric properties as a tool-evaluating climate for innovation (Mathisen and Einarsen, 2004).

MATERIAL AND METHODOLOGY

Research Approach

This study utilised a mixed method approach; combining quantitative and qualitative methods i.e. online survey and leadership semi-structured interviews. The choice of a mixed method was informed by the complexity of innovation at Universities and the need to take into account contextual factors. To obtain a holistic view the semi-structured interviews were conducted with senior leaders in charge of strategy as well as those responsible for driving innovation management activities. The researcher was mindful of the complexities around using a mixed-method approach for the study in terms of data integration and therefore necessary caution was exercised (Creswell, 2013).

Aspects that were explored using the mixed method approach include the Universities' definitions and conceptualisation of innovation, the drivers of innovation; how innovation is

understood and managed, and individual characteristics associated with innovation as these influence how successful Universities are in achieving innovation. The understanding of innovation and its drivers is embedded in contexts, i.e. the higher education sector, globalization, constructions of academia such as academic freedom as well as individual attributes of employees at Universities. The study was designed to examine innovation aspects from both an employee and leadership and management perspective.

Sampling and Data Collection

The population for this study comprised both academic and support staff at two (2) South African research-intensive Universities as well as targeted employees at senior levels and those involved in innovation and commercialization wings within the chosen Universities. Random and purposive sampling was employed for the survey and semi-structured interviews respectively, and research protocols at each University influenced the sampling approach. A snowballing approach was utilised to increase participation in the online survey at both Universities, where the survey was distributed by email to the researcher's associates. The administrative staff were instrumental in the distribution of the online survey and in providing contact details of the leadership informants for the semi-structured interview, who were identified based on their position and function at the second University. The semi-structured interviews were aligned with the survey questions and enabled the researcher to probe aspects of innovation within the University sector based on contexts, opinions and attitudes of key personnel and those in leadership and management. The interviews were conducted virtually due to the lack of physical access pending the COVID-19 pandemic and national lockdown.

Data Analysis

All data collected by surveys were analysed by computer (Saunders et al., 2016) using a statistical analysis tool, SPSS to explore relationships between the management of innovation and drivers with innovation success. Descriptive statistics such as percentages and means were utilised for data analysis. Multivariate analysis (MANOVA) for University, academic and professional services, age and gender was performed to determine relationships between variables. Data collected from the semi-structured interviews with senior leaders were explored using the computer software, NVIVO to support the thematic analysis process (a method for identifying themes in qualitative data) due to its versatility and flexibility (Terry et al., 2017).

RESULTS

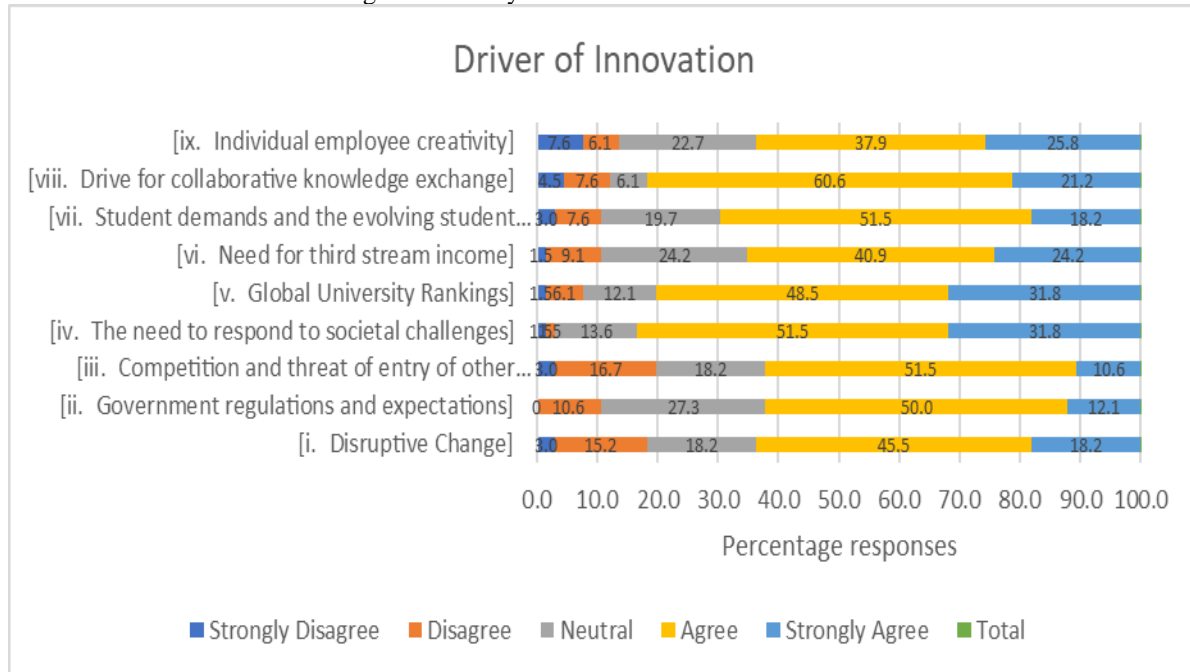
The statistical results from the online survey are reported first followed by qualitative findings from the thematic analysis. The findings from the online survey were compared with findings from the semi-structured interviews to confirm the statistical results.

Drivers of Innovation

One of the key objectives of the study was to explore the drivers of innovation at Universities i.e. those things that influence Universities to innovate. The results are reflected in Figure 3. indicate that participants perceived "the need to respond to societal challenges" as the key driver of innovation. 83.3% of participants agreed and strongly agreed with the statement, although the results were skewed more towards general agreement (51.5%) than strong agreement (31.8%). This was followed by "drive for collaborative knowledge exchange" (81.82%) and "global rankings" (80.30%) respectively. The statements associated with the least agreement from participants as drivers of innovation were "Competition and threat of entry of other providers"; "Disruptive Change" and "Individual employee creativity" in that particular order. A total of 19.7%, 18.18% and 13.64% of participants "disagreed" and "strongly disagreed" with these statements respectively.

The results were skewed towards general agreement rather than strong disagreement except for "Individual employee creativity" where the results were skewed towards strong disagreement.

Figure 3: Survey results for drivers of innovation



Source: Authors own analysis

Table 1 below reveals that employee perceptions of the drivers of innovation were not influenced by the University they came from, their age, their gender or their sector.

Table 1: Correlation results for drivers of innovation

Correlations – Drivers of Innovation															
		Univer sity	Gen der	Ag E	Sect or	Len gth of Serv ice	[i. Disru ptive Chan ge]	[ii. Gover nment regulat ions and expect ations]	[I Comp eti tion and threat of entry of other provi ders]	[iv. The need to respo nd to societ al challe nges]	[v. Glob al Univ er sity Rank ings]	[vi. Nee d for thir d stre am inco me]	[vii. Stud ent dem ands and the evol ving stud ent calib er]	[viii. Drive for collab orati ve knowl edge excha nge]	[ix. Indiv idual empl oyee creati vity]
Univer sity	Pears on Corre lat ion	1	-.004	.06 6	-. .184	-.094	-.145	-.246*	-.118	-.001	-.169	-. .266 *	-. .075	-.014	-.086
	Sig. (2- tailed)		.974	.59 6	.139	.451	.246	.046	.343	.996	.174	.031	.551	.912	.490
	N	66	66	66	66	66	66	66	66	66	66	66	66	66	66
Gender	Pears on	-.004	1	- .00	- .242	-.115	-.117	-.178	.062	.039	-.097	.075	- .156	.181	.105

	Correlation			5											
	Sig. (2-tailed)	.974		.966	.051	.359	.351	.152	.621	.753	.440	.549	.212	.145	.402
	N	66	66	66	66	66	66	66	66	66	66	66	66	66	66
Age	Pearson Correlation	.066	-.005	1	.049	.508*	-.049	-.057	-.029	.278*	.179	.141	.155	.165	.171
	Sig. (2-tailed)	.596	.966		.694	.000	.697	.650	.817	.024	.150	.260	.213	.186	.169
	N	66	66	66	66	66	66	66	66	66	66	66	66	66	66
Sector	Pearson Correlation	-.184	-.242	.049	1	.060	.124	.129	.048	.102	.081	-.091	.132	.134	-.075
	Sig. (2-tailed)	.139	.051	.694		.631	.322	.301	.700	.416	.518	.466	.289	.284	.552
	N	66	66	66	66	66	66	66	66	66	66	66	66	66	66
Length of Service	Pearson Correlation	-.094	-.115	.508**	.060	1	.060	.055	.000	.167	.098	.192	.115	.099	.063
	Sig. (2-tailed)	.451	.359	.000	.631		.631	.663	1.000	.180	.432	.123	.360	.431	.615
	N	66	66	66	66	66	66	66	66	66	66	66	66	66	66

Note: *. Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Source: Authors own analysis

Although, the result indicates that perceptions of the role of government regulations and expectations; and the need for third-stream income as drivers of innovation differed depending on the University where participants were employed ($\alpha = -0.246$, $p=0.05$; and $\alpha = -0.266$, $p=0.05$). However, this influence was negligible as indicated by Pearson values above (-0.3). A positive correlation ($\alpha = 0.278$, $p=0.05$) was found between the perception of the need to respond to societal challenges as a driver of innovation and participants' age.

Factors that Drive/ Influence Innovation

An understanding of what drives Universities to be innovative and factors that motivate and shape innovation efforts often determines their success or failure. Literature indicates several factors that drive Universities to innovate, i.e. technological advances, environmental and societal concerns, the need for knowledge exchanges, global rankings, student needs and expectations, as well as government regulations and expectations. This theme, is about the participants' (leaders') view on the drivers of innovation, and how these shape strategy, processes and practices for the management of innovation.

The section indicates the leaders' perceptions of innovation drivers at Universities. There were varied views on what drives Universities to innovate, and once again, issues of definition of innovation, and drivers, were apparent in that leaders seem to have responded from their understanding of what 'drivers' mean. Some of the drivers mentioned were, academic freedom, internationalization, diversity, curiosity, commitment, the right infrastructure, a very good understanding of risk and reward, a nurturing environment, leadership, and intelligence. These responses to the drivers came up across the interview questions and not specifically only with the question on drivers.

Most of these drivers seem to be at an employee level, whilst at the organisational level the participants noted that there were external and internal drivers of innovation, as one leader reflected,

"...The drivers of that are almost always external. In other words, you don't start innovative change internally because you want to be disruptive. You want to start because you concede that your ship is misaligned in the direction of travel from where the world is headed. So, if we use the world as a barometer, the world out there, the question then becomes, are we relevant to that world?"

Employees themselves were mentioned as a key drivers of innovation, and leaders highlighted the need to motivate employees to innovate in their respective spaces and that as starting point of what drives innovation. As captured by a participant,

"...there are some very good academics that are entrepreneurial, that do see the importance of working with industry, of translating what they're doing into solutions that can be utilized by industry and society."

Another leader reflected that;

"...effectively, there have to be more academics that are entrepreneurial... In the academics, we see that quality, you know, it is really such a strong driver and we effectively look at them as champions."

Some felt that employee-driven innovation was linked to self-interest;

"...one of the key factors that drive innovation is individual self-interest.... what makes it sad for me is that it doesn't speak to the problems that we see in our society. It only speaks to self-enrichment opportunities and they are there, a galore."

Some felt that students also drive innovation,

"...our students there are honestly some good students... they're so focused and they're a force that also needs to be harnessed at the university in terms of becoming more and more entrepreneurial."

Intellectual property and third-stream income were also seen as key drivers of innovation at Universities whilst disruption, similar to the one imposed by the COVID-19 pandemic was also cited as a key driver of innovation as reflected by these two participants,

"...covid-19 is a potential disruptor that can occur any time in the institution because you always have external threats."

"But to give you an example, one could argue that what we're doing now to push beyond emergency remote teaching and learning into online learning, pure online learning, is a form of innovation in the teaching and learning space, and it could even be disruptive because it is kind of kicking University into a whole new space in which we may very well change how we do business."

When asked directly whether innovation at Universities was driven/ influenced by government regulation, the leaders declined that was the case. However, government regulation in terms of the Intellectual Property Rights Act and the Research and Development Act was cited by several participants as having influenced Universities to have offices that were dedicated to innovation and technology transfer. This could explain why none of the Universities that participated in the study have dedicated offices that look at innovation broadly as part of their functions and operations. However, some participants questioned the pressure by the government for Universities to have technology transfer offices, since the view is that very little happens, especially, in non-research-intensive Universities.

The other aspect that was cited as government influencing/ driving innovation at Universities has to do with how funding is distributed hence some participants acknowledged the role of government. As a participant reflected,

"...So yes, because a lot of the subsidy models that government has to subsidize universities drive a certain kind of behaviour... And so if the university wants to maximize its income from the government, they will drive a certain type of behaviour within the organization."

It is worthwhile to note that the issue of state funding seems to be pushing some Universities to be more innovative to reduce their reliance on state funds, as outlined by a leader;

"Other institutions have said we should reduce our reliance on government. So what we should be doing is getting more money from the 3rd stream, and that is where they gotta be more innovative to get more 3rd stream funding,..".

Another participant also objected saying the government does not drive innovation at Universities but rather they facilitate it. He reflected,

"...Well in our system, especially in this space, is a facilitator. Government regulation facilitates, they enable universities to innovate. They do not drive it, they facilitate it."

DISCUSSION

An understanding of what drives Universities to be innovative and factors that motivate and shape innovation efforts often determines their success or failure. This study aimed to explore what employees and leaders deemed to be drivers of innovation at their respective Universities. Wipulanusat et al. (2019) argued that innovativeness in a public sector context (of which Universities are) is about the search for creative or novel solutions to problems and demands, new services, new organisational structures and improved processes. The survey results indicated that the top drivers of innovation at Universities were the need to respond to societal challenges, the drive for collaborative knowledge exchange, and global rankings. The results are consistent with both institutional Theory and organizational Theory's perspectives on innovation. Responding to societal challenges and the drive for collaborative knowledge exchange as drivers to public institutions' innovation behaviour is consistent with the cultural cognitive element in bringing value to society and participating institutions. Responding to global rankings is consistent with the institutional element's regulative element's perspective due to the conformity to the rules in the global ranking institution.

Whilst interview findings indicate there were varying views on what drives Universities to innovate, and once again, issues of definition of innovation, and drivers, were apparent in that leaders seem to have responded from their understanding of what 'drivers' mean, despite the researcher's provided definition. Responding from own views is consistent with Institutional Theory's cultural cognitive element concerning leadership's assumptions (Farisani 2023; Scott, 2013).

Some of the drivers mentioned to be contributing to innovation at Universities were individual employee drive, academic freedom, internationalization, diversity, curiosity, commitment, the right infrastructure, a very good understanding of risk and reward, a nurturing environment, leadership, intelligence, students and disruption. These responses to the drivers came up across the interview questions and not specifically only with the question on drivers. These drivers seem to cut across employee and organisational levels and the participants noted that there were external and internal drivers of innovation.

With regards to government influencing/ driving innovation at Universities, there was a disjuncture between what the leaders interviewed said and the examples they provided. For example, when asked directly whether innovation at Universities was driven/ influenced by

government regulation, the leaders declined that was the case. However, government regulation in terms of the Intellectual Property Rights Act and the Research & Development Act was cited by several participants as having influenced Universities to have offices that were dedicated to innovation and technology transfer. This is consistent with the Institutional element's regulative element. Nevertheless, the finding on the disjuncture could explain why none of the Universities that participated in the study do have dedicated offices that look at innovation broadly as part of their business and operations.

Some participants acknowledged that the government influences innovation at universities through funding models, where certain activities are rewarded through additional funds to the Universities e.g. research productivity. However, some participants questioned the pressure by the government for Universities to have technology transfer offices, since the view is that very little happens, especially, in non-research-intensive Universities. Findings from the survey confirmed this where about two-thirds of the respondents agree that government regulations and expectations were a key driver of innovation at Universities. Interestingly survey findings indicated the least agreement with disruptive change and individual employee creativity as drivers of innovation; which deviates from the findings of the leadership semi-structured interviews.

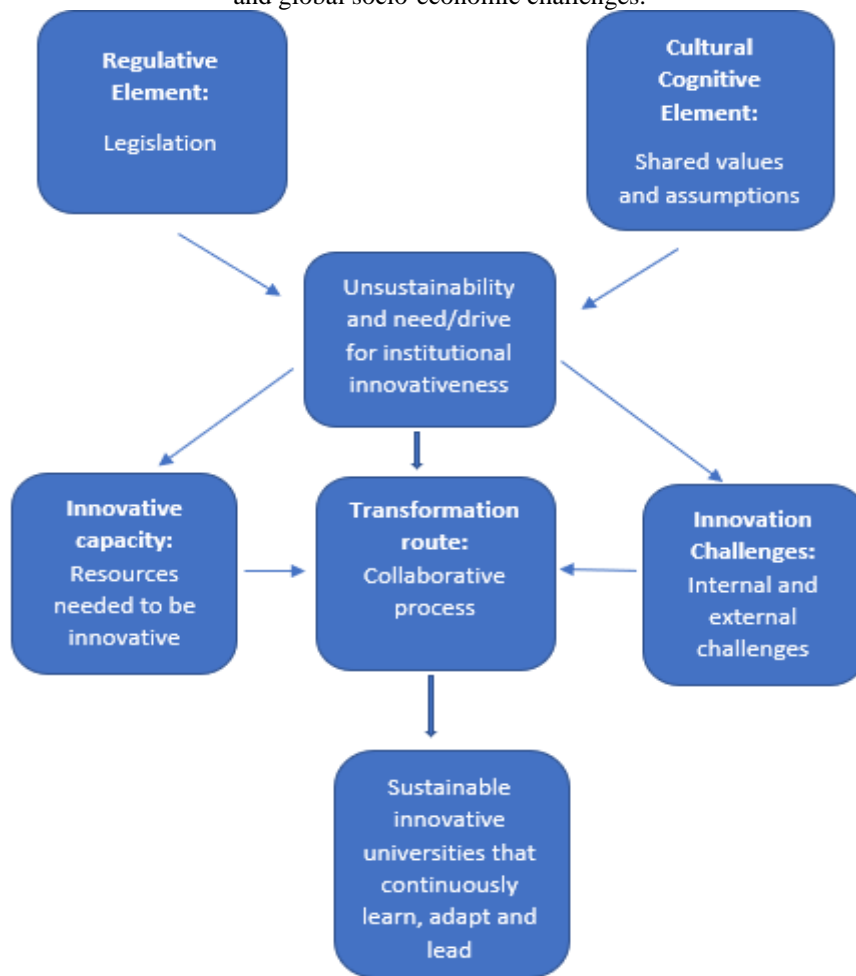
The findings are consistent with the literature which cited drivers of innovation as the individuals, teams, enterprise, processes, offerings, psychological climate, physical environment, organisational culture, economic climate, market conditions and geopolitical culture (Baporikar, 2015). Such findings are also consistent with Organisational Theory's perspective in that innovation is influenced by both internal and external stakeholders and factors. Majeed and Kadhumb (2023) affirm and assert that "Both internally and externally of the company, useful ideas can be acquired".

Further, (Owolabi et al., 2019) asserted that innovation is driven by four (4) factors, i.e. environmental concerns, technological knowledge, knowledge exchanges and boundary spanning. For Universities, the boundary spanning may include co-innovation that spans nationally and globally as outlined by the reflections of semi-structured interviews where leaders highlighted the multidisciplinary and multinational nature of innovation. Owolabi et al. (2019)'s assertion is consistent with Demircioglu and Van der Wal (2022) and resonates with organizational Theory's perspective in that both internal and external stakeholders are key drivers of innovation in a public institution. Literature also indicates that customers/ clients also influence innovation through their demands and expectations and this was confirmed by the

survey results, where 69.7% of participants agreed that student demands and expectations were a key driver of innovation at Universities. The findings are also consistent with Institutional Theory's cultural cognitive element as far as being innovative to meet students' value expectations (Farisani 2023; Scott, 2013).

These findings once again highlight the need for Universities to understand the factors that influence or drive them to innovate, to cautiously plan strategies and align these with practices. A finding that is consistent with Udin's (2023) findings concerning learning organisations. A proposal for universities to understand the resources needed from all the relevant stakeholders and the factors that influence the internal and external stakeholders to participate in the institutional innovative path in South African universities is suggested below.

Figure 4: A conceptual model of the influence of regulative and cultural cognitive elements transforming unsustainable universities needing innovative solutions into innovative institutions responding to South African and global socio-economic challenges.



Source: Authors Own creation

A proposed framework borrows from both institutional and organizational theories in moving public universities from unsustainability and the need for innovation into sustainable innovative institutions. Sustainable innovative universities that respond to not only the expectations of immediate internal and external stakeholders such as students and the South African government but regional and world socio-economic challenges. Regional and world socio-economic challenges are experienced by different communities scattered around the globe.

The proposed conceptual model suggests to university leadership how to strike a balance between relevant legislation, shared values and assumptions of all stakeholders to address unsustainability and the need for institutional innovativeness. It is further suggested that the university leaders need to embark on the collaborative transformation route that considers all stakeholder's available resources, and internal and external factors to achieve their goal. Their

goal is sustainable innovative universities that continuously learn, adapt and lead in solving regional and global socio-economic challenges.

CONCLUSION

The purpose of the study was to explore the views of employees and leaders on what they deemed to be drivers of innovation at their respective universities with the view to suggest a sustainable conceptual model for public universities' innovativeness. Findings indicate there were varying views on what drives Universities to innovate, and once again, issues of definition of innovation, and drivers, were apparent in that leaders seem to have responded from their understanding of what 'drivers' mean. Some of the drivers mentioned to be contributing to innovation at Universities were the need to respond to societal challenges, the drive for collaborative knowledge exchange, and global rankings, individual employee drive, academic freedom, internationalization, diversity, curiosity, commitment, the right infrastructure, very good understanding of risk and reward, a nurturing environment, leadership, intelligence, students and disruption. With regards to government influencing/ driving innovation at Universities, there was a disjuncture between what the leaders interviewed said and the examples they provided. Some participants acknowledged that the government influences innovation at universities through legislation, and funding models, where certain activities are rewarded through additional funds to the Universities e.g. research productivity.

Interestingly survey findings indicated the least agreement with disruptive change and individual employee creativity as drivers of innovation; which deviates from the findings of the leadership semi structured interviews. Findings confirmed that student demands and expectations were a key driver of innovation at Universities. It is recommended that for Universities to define their visions for innovation, and analysis of the drivers or aspects that influence innovation, careful reflections must be entered into by all relevant internal and external stakeholders. Careful reflections must be entered into by all relevant internal and external stakeholders (see figure 4) so that Universities can define the scope of innovation they wish to pursue based on their resources and contexts since Universities differ.

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