



Change in Research Paradigm and the Enhancement of Relevance of State Higher Education System in Cameroon

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ABSTRACT

*This study was designed to examine change in research paradigm and the enhancement of relevance of state higher education system in Cameroon. This study has as major objective to evaluate how change in research paradigm enhances relevance in state higher education system in Cameroon. With specific interest on; recommendations to improve on research output in university institution, changes in research activities expected in university institution and if changes in research paradigm (approaches, method and funding) will improve the relevance of higher education. The concurrent mixed-methods research design was adopted for the study. Questionnaire and an interview guide were the instruments used for the study. The sample population for the study was made up of 1,915 lecturers, and 40 administrators (HODs) from the universities of Buea, Yaounde II, Douala, Bamenda, Yaounde I, Dschang, Maroua and Ngaoundere. The purposive and stratified sampling techniques was adopted for the study. Data from close ended questions was analysed using SPSS 23.0, with the aid of descriptive and inferential statistical tools while open ended questions and the interview were analysed thematically. The Spearman's rho was used to test the lone research hypotheses. Majority of the 45.8% of lecturers indicate the need for change in research paradigm for the Enhancement of Relevance in Higher Education. Hypothetically, there is a significant, positive and strong relationship between change in research paradigm and the enhancement of relevance of state Universities (R -value 0.458**, p -value $< 0.001 < 0.05$). The positive sign of the correlation value implies that changes in research paradigm will contribute to the enhancement of higher education relevance and this is supported with a high explanatory power of 87.2% (Nagelkerke statistics= 0.872) and this was also accepted by 83.3% (1431) of lecturers. Thus, the null hypothesis was rejected while the alternative was accepted. It is recommended that, research seminars/workshop, more grants, research center and library, research results implemented, and research should reflect contextual realities. As changes in research paradigms can improve the relevance of higher education if suitable to the actual challenges we meet in the country.*

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INTRODUCTION

Over the years, the landscape of research and higher education has been undergoing significant transformations worldwide. These changes are driven by the dynamic nature of knowledge, emerging technologies, and the evolving needs of society. In Cameroon, like many other countries, the state higher education system is recognizing the importance of adapting to this changing research paradigm to enhance its relevance and impact (Maguatcher, & Ning 2023). The traditional research paradigm has often focused on knowledge creation within the confines of academic institutions, with limited emphasis on real-world applications and addressing societal challenges. However, there is a growing recognition that research should not exist in isolation but should actively contribute to the development and well-being of the nation (Kivunja & Bawa, 2017). In recent years, there has been a shift towards a more collaborative and interdisciplinary approach to research, where academia, government, industry, and civil society work together to address complex problems. This change in research paradigm recognizes the need for research outcomes to be relevant, applicable, and responsive to the needs of society. In Cameroon, the state higher education system has also realized the importance of aligning research efforts with national priorities and the needs of local communities. By enhancing the relevance of research, universities can play a pivotal role in driving innovation, economic growth, and social development.

To achieve this, universities in Cameroon are fostering partnerships with industry, government agencies, and non-profit organizations to ensure that research activities are not just theoretical exercises but also contribute tangibly to the development of the country. These collaborations facilitate knowledge transfer, technology transfer, and the practical application of research findings. Research that addresses pressing societal challenges such as poverty alleviation, healthcare improvement, environmental sustainability, and socio-cultural preservation. By prioritizing research in these areas, universities can contribute to the overall well-being and advancement of the nation. The impact of change in research paradigm on the relevance of state higher education systems is of paramount importance. As the changing research paradigm and the emphasis on enhancing the relevance of the state higher education system in Cameroon reflect a global trend towards research that is more collaborative, interdisciplinary, and impactful. By fostering partnerships, aligning research priorities with societal needs, and addressing pressing challenges, universities in Cameroon can position themselves as key drivers of development and agents of positive change to meet 21st century needs.

Context and Justification of Study

The goals of the 1993 reform were to make university education sustainable through professionalization of university studies to produce graduates who could contribute significantly in the public and private sectors of the country thereby promoting sustainable development through research outreach activities (Fonkeng, 2008; Fonkeng & Ntembe, 2010). Ngwana (2001) opined that the aim of the reform among other things was to bring about changes in the relevance of higher education system with emphases on administration, financing, policy making and research. Some of the specific objectives of the reforms which are further echoed in Law No. 2001/005 as the objectives of higher education in Cameroon are to: Provide a more conducive environment for teaching and research paradigm and outreach; Make programs more varied, professional, adapted and responsive to the need of the job market by providing programs that will make graduates find employment in both public and private sectors in line with the nation's development agenda; Make universities more accessible to all categories of qualified citizens and local, Regional and international communities; Train Citizens with sound democratic credentials, who are conscious of the need for an inclusive equitable society, promote ethical moral values, bilingualism, national unity and integration; Revive and maximize inter-university and international cooperation.

In order to achieve these objectives, Universities were required to define, in consultation with other stakeholders, their relevance, involve professionals in the conception of research and programmes, and draw up the profiles of teaching staff to be recruited with the aim of enhancing relevance and research activities. Leroux (2014) and Ngwana (2001), despite this great vision, for many years, point out that the relevance of higher education was not directly capturing professionalization, employability, and skill acquisition despite the articulation in policy papers. Besides the 1993 reforms, there have been revisions and additions which relate to Higher Education. Some of these include Law No. 005 of 16th April 2001 on the orientation of higher education in Cameroon, the new policy on university governance laid down in decree No. 2005/383 of 17th December 2005 and the 2006-2009 Education Sectors Strategic Plan (ESSP).

Law No. 005 of 16th April 2001 on the orientation of higher education in Cameroon defines higher education in terms of teaching, research, and contribution to development, bilingualism and cooperation. In line with the change process for the enhancement of relevance, the law emphasizes that for the relevance of HE to be upheld in terms of skill acquisition and professionalization, attention should be on the training and further training of senior staff who are at the forefront of promoting and enhancing higher education relevance by organizing the training of trainers

and researchers to meet up the changing needs of the job markets. Train senior staff for scientific and technical domains to attend to the fast-growing global world. With regard to administrative change, the 2001 Law aimed at moving from a centralized system of higher education administration to a decentralized territorial unit, socio-economic partners, as well as national or international state or private institutions or organizations shall contribute to the elaboration and implementation of the higher education policy according to the formal and regulatory means to boost its relevance. Approve syllabuses and the common rules in obtaining certificates awarded by private higher education institutions under the mentorship of state higher institutions. Program university development, through the Higher Education Development Plan in collaboration with decentralized territorial units and socio-economic partners, ensuring that higher education is relevant, quality-oriented and continuously adapted to suit needs. To this end, administrators through a decentralized system shall manage and supervise all internal services and operational structures of higher education institutions. In essence, to meet the challenges and expectations of higher education institutions in Cameroon, the issue of enhancement of relevance in higher education has to be treated appropriately. The state higher education system in Cameroon is facing the challenge of adapting to the changing research paradigm and enhancing its relevance to effectively address the needs of society. The traditional focus on knowledge creation within academic institutions has limited the practical application and impact of research outcomes. There is a pressing need to shift towards a more collaborative, interdisciplinary approach, where research is conducted in partnership with industry, government agencies, and non-profit organizations, and addresses pressing societal challenges (Moutinho, Fernandes, & Roque, 2023). This shift requires universities in Cameroon to foster a research culture that aligns with national priorities, promotes knowledge and technology transfer, and actively contributes to the economic, social, and environmental development of the country. Today, higher education operates in an environment which is continually changing and thus needs attention. Therefore, a change in research paradigm will be a very significant aspect for the enhancement of relevance in state higher education system in Cameroon.

This study has as major objective to evaluate how change in research paradigm enhances relevance in state higher education system in Cameroon. With specific interest on;

- i. Recommendations to improve on research output in university institution
- ii. Changes in research activities expected in university institution
- iii. If changes in research paradigm (approaches, method and funding) will improve the relevance of higher education

Based on the above objectives, one general hypothesis was tested which verified the significant relationship between change in research paradigm and the enhancement of relevance of state higher education system in Cameroon.

2. LITERATURE REVIEW

Changes in research paradigms refers to a major innovation and change in the worldview, concepts, and practices of research to bring about transformation and adaptation to the changing need of the society (Lauriala, 2013). Change in research paradigm refers to a fundamental shift in the underlying assumptions, theories, methods, and approaches that guide scientific inquiry within a particular field or discipline. It involves a reevaluation and transformation of the dominant frameworks and perspectives that shape research questions, methodologies, and the interpretation of findings (Boyd & Crawford, 2012). Change in research paradigm often occurs when existing paradigms no longer adequately explain phenomena or when new insights and theories emerge that challenge established beliefs. This leads to the emergence of new theories, concepts, and methodologies that revolutionize the field and reshape the direction of research. Change in research paradigm is a complex and iterative process that involves the engagement of researchers, scholars, and the wider scientific community. It requires critical reflection, openness to new ideas, and the willingness to challenge established norms. Additionally, paradigm shifts often involve interdisciplinary collaborations, as they can bridge multiple fields and perspectives to generate innovative approaches and theories.

The concerns of educational leaders and researchers is that educational research is often divorced from the problems and issues of everyday teaching practice, resulting in "unusable knowledge" (Lagemann, 2002), is strongly influenced by the chosen paradigm in which the research is framed. In order to produce professional knowledge that can be applied in practice, Haertel and Means (2004) called for (a) research that addresses the questions that educational leaders and teachers care about, (b) integration of local understanding driven by researcher-policymaker partnerships with disciplinary knowledge, and (c) the use of research findings to inform and transform practice. In response to the concern to produce usable findings, Bednarek & Dube (2021) argues for research that is born out of the collaborative partnership between researchers and policymakers focused around inquiry that is of interest to educational leaders and teachers with the intention of informing practice.

Terashima et al., (2003) argues that such research needs to be framed in an appropriate paradigm that furthers the understanding of how and why an innovation works within and across settings over time. The development of a theory-driven research paradigm

that accommodates complex interventions that can be informed and improved through empirical study. The recent emergence of an important research method, called 'design-based research' (Design-Based Research Collective, 2003), provides a sound basis from which a more explicit framework is developed. The premise of design-based research paradigm, to promote, sustain, and understand innovation in the world, particularly in an educational context, has maintained a close synergy with the development and adoption of ICT in educational practice. Design-experimentation has become, over the past decade, an increasingly accepted mode of scholarly inquiry appropriate for the theoretical and empirical study of change in everyday educational settings brought about by complex educational interventions (Bell, 2004).

Design-based research brings together research on educational practice and its effects by employing the scientific processes of discovery, exploration, confirmation and dissemination (Kelly, 2003). This interconnection of research practice complements the fundamentally interventionist nature of education and provides practical and theoretical progress in the field by conducting empirical research in naturalistic settings. Higher education, research and innovation are increasingly regarded as core elements of a country's knowledge system, which is defined as "an organized structure and formal process for generating and representing content, components, classes, or types of knowledge" (Meek and Davies, 2009; 46). Many countries have developed national strategies and policy frameworks to capitalise on their higher education systems' potential to deliver relevance through research and innovation. Such frameworks often comprise a mix of policies such as setting research priorities to meet national needs, assessing research outputs, adjusting governance and funding models with stronger emphasis on research and innovation, and establishing designated units to facilitate and promote cooperation between institutions and industry.

Many countries have reformed their financial aid models to incentivise students to pursue doctoral studies or have introduced new indicators into performance-based funding models to enhance research performance and encourage knowledge transfer activities (De Boer et al., 2015). Others have incorporated a professional dimension into their study programmes to build closer ties to industry and promote innovation (Dill and van Vught, 2010). German universities, for example, have established Research Training Groups to enhance national research capacity and promote young researchers. The Netherlands has been active in developing high quality research capacity by funding centres of excellence (Jongbloed, 2010). Research Excellence Initiatives (REIs) have also expanded over the years, with two-thirds of other countries currently engaging in like activities, compared to less than 10% in the 1990s (OECD, 2014).

A fundamental change in the policy approach to innovation has been the move from the traditional linear model which views basic research as sufficient to

promote innovation capacity to a context of national innovation systems, which comprise "complex institutional landscapes that influence the creation, development, and dissemination of innovations" (Mowery and Sampat, 2009: 2). National innovation systems reflect more interdependent, interactive and reciprocal linkages between different actors and organisations (van Vught, 2009). Linkages between education, research and innovation, also referred to as the Knowledge Triangle (Maassen and Stensaker, 2010), have become increasingly important in building and sustaining innovation systems, and fostering job and economic growth.

Higher education can make an important contribution to building a stronger society, ending extreme poverty, and boosting shared prosperity. It can serve the community by contributing knowledge and advanced skills as well as basic competencies and research. Research plays a growing role in the global economy, driving economic growth and productivity. Economic studies have shown a positive relationship between research and economic growth, particularly those that take into account the quality of research and education (Barro 2013; Hanushek and Woessmann, 2012).

Universities today face new challenges. Exponential growth in the demand for higher education, significant decreases in the changing nature of knowledge, changing student demographics and expectations, global competition in the provision of relevant higher education, rapid advances in information and communications technologies demand a re-examination of how universities fulfil their core functions of storage, processing, dissemination, and application of knowledge to real-life problems (Tiffin & Rajasingham, 2003).

The higher education community generally identifies three distinct but interrelated missions (Sánchez-Barrioluengo 2013) one of which is research. The second mission consists of research that can lead to greater competitiveness, and foster innovation (Altbach, Reisberg, and Rumbley 2009). This varies greatly, ranging from applied research, which largely generates private benefits, to pure research, which creates public goods. Both pure and applied research are important foundations for future innovation and complements of education (Salmi, 2009).

Higher education institutions, most prominently universities - have three functions in total. In addition to education, these are research and contributing to society (World Declaration on Higher Education, 1998). The research and education functions are two sides of a coin; research makes a higher level of education possible and education, in turn, develops the human resources to do research. Recently, contributions to society have increasingly been demanded of higher education institutions. This means the higher education institutions need to have activities to ensure that accumulated knowledge is circulated directly back to society and that they do not become "ivory towers."

The nature of change in research paradigm according to Kuhn is “what members of a scientific community, and they alone, share” and “when the world changes, research paradigm itself changes with them” (Kuhn, 2019). The inference is that paradigms shift when a society or community as a whole is changing. Over the ages universities have undergone many research paradigms shifts in what and how they research, teach and to whom. Medieval theological elitist universities became modern industrial universities. Emerging virtual universities are attempts by institutions of higher education to change with time in order to remain relevant in the future. The effects of the digital age on higher education—concepts such as e-learning and mobile learning (m-learning)—are subjects of interesting academic research. They seem, however, to be somewhat divorced from the day-to-day realities that currently face students and teachers.

The idea of integrating teaching and research is particularly relevant in the current Higher Education context where there is a tendency for research and teaching to be seen as discrete or even competing activities. Grigg (2005) argues that more than anything, a change in research paradigm will enable graduates to participate actively in knowledge creation and practices of learning within their own discipline and work environments. Franz (2007) discusses this in relation to the graduate context, holding that students’ simultaneous connection with academia in the context of transformative engagement enables iterative relationships to develop for research, teaching and application, advancing at the macro level the scholarship of integration.

African Union Second Decade of Education: Tertiary Level (Prospects)

- i. Encourage greater mobility of academics, researchers, staff and students and recognition of qualifications from different regions through harmonization of degree structures.
- ii. Establish an African Higher education and Research Space that will pay serious attention to institutional and national quality assurance systems and promote high level relevant research and post-graduate training tailored towards solving Africa’s problems.
- iii. Use ICT effectively for instructional delivery, professional communication to develop, acquire, produce and distribute knowledge, skills and competencies across the continent; and
- iv. Create centres of excellence within regions of the continent to develop robust post-graduate studies and develop strong research base and global competitive advantage.

Thus, there is an urgent need of ensuring access to quality education. Tertiary education is the backbone of research and development, an area where Africa lags significantly. The Goals of the Reforms of 1993 added that Universities be provided a more conducive

environment for teaching and research by creating a better atmosphere for teachers, teaching and research; revive and maximise inter-university and international co-operation. Motivate staff and improve living conditions of staff and students through better remuneration.

To be the best worldwide in research, HE institutions need to strengthen their research capacity (BIS, 2009). In order to achieve this challenge, HE institutions need to develop multidisciplinary centres bringing together many areas of expertise and building relationships between teams in Universities and industries to well establish their research capacity. In United Kingdom, maintaining the quality in research is taken seriously and the government has increased funding for improving the quality of research. Providing adequate funds to state universities in Cameroon to support research activities is another way to help address the issue of quality and relevance.

From a theoretical point of view, the educational change model by Fullan (1940-Present) argued that educational change is a process and to begin the change process you must be able to fully involve all human participants (stakeholders) in the change process for a better sustainability (Fullan, 1999, Ellsworth, 2000). The day-to-day functioning of educational institutions is about changing or enhancing the capacity of teachers, learners, administrative staff in the domains of knowledge, skills, attitudes and policy geared towards the enhancement of relevance in the education system and according to (Fullan, 2007), the role of the leader in the change process is very critical. This theory is relevant to this study in that it advocates for a proposed change/innovation in research paradigm, for the sustainability or enhancement of HE relevance for sustainability in Cameroon. Consequently, Fullan’s Framework provides a systematic approach to aligning research priorities, teaching methods, curriculum, and institutional policies, promoting interdisciplinary collaboration and addressing societal needs. Fullan’s emphasis on capacity building enables universities in Cameroon to develop the necessary skills and competencies among faculty members, researchers, and students to conduct applied research and effectively communicate findings. Furthermore, Fullan’s focus on leadership is crucial for inspiring and mobilizing stakeholders towards a shared vision, fostering a supportive environment, and driving the necessary changes (Sergiovanni & Starrat 2000). By applying Fullan’s educational change model, universities can transform their research efforts, build capacity, and provide effective leadership, ultimately enhancing the relevance and impact of the state higher education system in Cameroon.

3. METHODOLOGY

The concurrent mixed-methods research design specifically the concurrent triangulation design was

adopted for the study. The population of the study comprise of the eight (08) long existing state universities of Buea, Yaounde II, Douala, Bamenda, Yaounde I, Dschang, Maroua and Ngaoundere. The sample population for the study was made up of 1,915 lecturers and 40 administrators (HODS) from the universities. The purposive and stratified sampling techniques was adopted for the study. The instruments use for data collection were a questionnaire (closed and open-ended questions) for lecturers and an interview guide for university administrators (HODS). Data from the close ended questions was analysed using SPSS 23.0, with the aid of descriptive and inferential statistical tools while open ended questions were analysed thematically. The hypotheses of the study were tested using a non-parametric test (Spearman's Rho test) presented at 95%

level of confidence interval with alpha set at 0.05 levels accepting 5% margin of error.

4. FINDINGS AND DISCUSSION

The findings of the study are presented and supported by literature and the works of other researchers. Quantitative data is presented first followed qualitative data.

4.2 Change in research paradigm and the Enhancement of Relevance in Higher Education

The table below depicts lecturers' opinion on change in research paradigm and the enhancement of relevance in higher education.

Table 1: Lecturers Opinion on change in research paradigm and the Enhancement of Relevance in Higher Education

Statements	Stretched				Collapsed	
	SA	A	D	SD	SA/A	D/SD
There is a need for improvement in research output.**	945 (55.0%)	680 (39.6%)	92 (5.4%)	1 (0.1%)	1625 (94.6%)	93 (5.4%)
Research works in Cameroon is applicable to international policies	196 (11.4%)	1018 (59.3%)	430 (25.0%)	74 (4.3%)	1214 (70.7%)	504 (29.3%)
Research works in my institution can compete with the global research world.	249 (14.5%)	960 (55.9%)	401 (23.3%)	108 (6.3%)	1209 (70.4%)	509 (29.6%)
My institution has clearly defined research policies	278 (16.2%)	889 (51.7%)	383 (22.3%)	168 (9.8%)	1167 (67.9%)	551 (32.1%)
Research in higher education fosters innovation	354 (20.6%)	811 (47.2%)	426 (24.8%)	127 (7.4%)	1165 (67.8%)	553 (32.2%)
I received a research allowance from the state which enables me to effectively carry out research activities like publications, conferences etc.	414 (24.1%)	672 (39.1%)	404 (23.5%)	228 (13.3%)	1086 (63.2%)	632 (36.8%)
University research is geared toward resolving local problems	258 (15.0%)	791 (46.0%)	442 (25.7%)	227 (13.2%)	1049 (61.1%)	669 (38.9%)
My university has adequate opportunities for the training of young researchers	134 (7.8%)	786 (45.8%)	598 (34.8%)	200 (11.6%)	920 (53.6%)	798 (46.4%)
My institution has higher-quality journals for publication.	100 (5.8%)	662 (38.5%)	663 (38.6%)	293 (17.1%)	762 (44.4%)	956 (55.6%)
I have adequate research opportunities (eg research grants, funding, seminars)	184 (10.7%)	469 (27.3%)	765 (44.5%)	300 (17.5%)	653 (38.0%)	1065 (62.0%)
Multiple Responses Set (MRS)	2168 (12.6%)	7150 (41.6%)	5192 (30.2%)	2670 (15.5%)	9318 (54.2%)	7862 (45.8%)

**Item with coding reversed during calculation of MRS

n=1718

In aggregate, 45.8% of lecturers indicate the need for change in research paradigm while 54.2% did not. Specifically, 94.6% (1625) of lecturers indicate the need for improvement in research output. But, while 70.7% (1214) of lecturers said research works in Cameroon is applicable to international policies while 29.3% (504) disagreed. Similarly, while 70.4% (1209) opined that research works in their institution can compete with the global research world, 29.6% (509) disagreed. The desire for change in research paradigms can stem from

various factors such as the evolving nature of research fields, the need to address societal challenges effectively, or the desire to align with international research standards. Research paradigms and shifts in research practices can provide insights into the motivations and benefits of such changes (Creswell, 2014; Lincoln et al., 2011). Applicability of research to international policies depends on the relevance, rigor, and alignment of research findings with global challenges and policy frameworks, Knowledge transfer,

policy impact, and international research collaborations can shed light on the factors influencing the applicability of research to policy contexts (Owen et al., 2019; Van den Broek et al., 2018).

Also, while 67.8% (1 167) of lecturers agreed that their institution has clearly defined research policies, 32.1% (551) denied with 32.2% (553) also rejected that research in higher education fosters innovation. Clearly defined research policies can provide guidelines, frameworks, and support structures for conducting research activities within an institution. Research governance, policy development, and institutional frameworks can provide insights into the importance and impact of well-defined research policies (Mugabi et al., 2018). Again, while 63.2% (1086) of lecturers agreed to receive research allowance from the state that enables them to effectively carry out research activities like publications, conferences etc, 36.8% (632) disagreed. Research allowances or funding can significantly impact the ability of researchers to effectively carry out research activities, such as publishing papers, attending conferences, or conducting experiments (Hicks et al., 2015; Katz, 2019).

Furthermore, while 61.1% (1049) of lecturers said University research is geared toward resolving local problems, 38.9% (669) denied with 46.4% (798) also indicate that their university lack adequate opportunities for the training of young researchers. Many universities prioritize research that addresses local challenges and contributes to the development of their communities. This focus on local problem-solving is often referred to as engaged scholarship or community-based research (Boyer, 1996). Universities recognize the importance of research that has practical applications and can make a positive impact on local societies. Providing training opportunities for young researchers is crucial for the

development of the next generation of scholars. Research assistantships, mentorship programs, workshops, and capacity-building initiatives are some of the ways universities can support young researchers in their training and professional growth (Baker et al., 2018). However, there may be instances where universities face challenges in providing adequate training opportunities for various reasons.

Furthermore, 55.6% (956) of lecturers denied that their institution has higher-quality journals for publication. And, 62.0% (1065) denied to have adequate research opportunities (e.g. research grants, funding, seminars). The perception of journal quality may vary among researchers and institutions. Factors such as impact factor, peer review process, editorial reputation, and disciplinary norms can influence the perception of journal quality (Vancly, 2019). It is important for researchers to critically evaluate journals based on their own research goals, target audience, and the rigor of the publication process. Research opportunities encompass a wide range of factors, including access to research grants, funding, and opportunities to present and share research findings through seminars and conferences. Adequate research opportunities can significantly impact the productivity and success of researchers (Cummings et al., 2017). However, availability and accessibility of research opportunities may vary across institutions and disciplines.

Recommendations to improve on research output in university institution

The table below depicts lecturers' opinion recommendations to improve on research output for the enhancement of relevance in higher education.

Table 2: Lecturers Opinion on Recommendations to Improve on Research Output

Themes	Quotations
Funding /increase research allowance	<i>"The university must produce funding to enable researchers to visit external laboratories all over the world."</i> <i>'Funding of research projects adapts to national problems"</i> <i>'More financing and valorization of research results."</i> <i>"To give financial means to teachers/ students to do their best."</i> <i>'Improve funding and public support for research."</i> <i>"More subventions and increase research financing"</i> <i>"Every university must have funded research programs, with objectives linked to the development of the country"</i> <i>"Greater funding should be made available for researchers"</i> <i>"Improvement of research funding"</i> <i>'A better an effective research allowance will increase the number of researchers"</i>
Research equipment (computers, laboratories, books)	<i>"Procurement of research equipment. »</i> <i>'Equipping teachers with high-performance computers.'</i> <i>'Equip laboratoires »</i> <i>« More research handbooks should be made available"</i> <i>"More research equipment should be provided"</i> <i>"Construct and equip more laboratories"</i> <i>"Finance the equipment of laboratories"</i> <i>"Libraries should be well equipped with textbooks"</i> <i>"The university and the government should help young researchers with adequate materials that they need for research"</i> <i>"Well equipped computer labs, should be created for computer students in order to help them do effective practicals and even research"</i>
Regular capacity building programmes	<i>"Frequent organization of seminars and symposia"</i> <i>"Availability of training grants and refresher courses"</i> <i>'Make training and competition universal."</i> <i>"Involve teachers in refresher courses, and provide them with more resources (laboratories, magazines, libraries)"</i> <i>"Research seminars should be organized often"</i> <i>"Increased research training"</i> <i>"The university administration can organize research seminars that will create a forum to learn"</i> <i>'In-service training on research"</i>
Reflection of local realities (solving practical problems)	<i>"That the research reflects the local reality and that it drives change by involving the expected results"</i> <i>'Design and fund projects that are of benefit to the community."</i> <i>'Research should be channeled to solving practical problems, local problems. In this way, the impact will be felt"</i> <i>'Research should be tailored to local challenges and there should be formal instruments to measure"</i> <i>"Research must be geared towards solving current local issues"</i> <i>"Need for research supervisors to encourage students to conduct research that solves real-life problems"</i> <i>"Research should be societal centred."</i> <i>'Institutions should be advised to encourage research topics that are relevant with existing situations"</i>
Adequate supervision of students	<i>"Strict supervision to ensure quality and to meet the needs of the growing educational world"</i> <i>"Supervisors should be serious with their supervisees"</i> <i>"The various supervisors supervising the students should be serious in following of students' laboratories performance".</i> <i>"Supervisors should be serious in following up students."</i> <i>"Supervisors should always follow obvious students during their research."</i> <i>"Lecturers should keep aside their personal grudges when supervising students"</i>
Increase access and partnership	<i>"Better access to research opportunities and partnerships"</i> <i>"Internationalized scientific reviews and journals"</i> <i>'Adequate research opportunities"</i> <i>"Strengthen relations with external organizations that can facilitate research."</i>

	<i>"Increase collaborative research »</i> <i>'We may need to make our research works more applicable to international policies'</i>
Good internet and free Wi-Fi	<i>"The institution should have an internet connection"</i> <i>"Free internet connection should be established in school and research advance should be increased. Since books are bought from online and stuffs of the sort"</i> <i>"The Wi-Fi system should be installed in school"</i> <i>"Free on campus Wi-Fi for students to do their research"</i> <i>"Free Wi-Fi should be available on campus"</i> <i>"Wi-Fi should be installed on campus"</i>
Motivation	<i>"If the lecturers and the students are well motivated, they will get unto the world and provide concrete solutions to issues"</i> <i>'Motivation should be given to researchers so as to finance the process'</i> <i>'Teachers/students should be motivated to do research'</i> <i>'Motivation for effective research.'</i>
Equipment of libraries	<i>"Well equipped libraries should be made available in school to help students carry out research and also do references."</i> <i>"Libraries should be created and well equipped"</i> <i>"libraries should be made available in order to help students on textbooks"</i> <i>'Well-equipped libraries. The conditions given to the students to follow before entering the library should be amended'</i> <i>"Libraries should be well equipped. This will help students study well and also do their research"</i>
Collaboration	<i>"Interdisciplinary collaboration"</i> <i>'We should have coordinated research across departments and schools'</i> <i>"Teamwork should be encouraged, that is lecturers of the same discipline should be encouraged to work as a group for more publication of high-quality articles"</i>
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Creation of research centre	<i>"Strengthen research programs by creating applied and basic research centres"</i> <i>"There is a high demand for research centres in the university."</i> <i>"Good research centres."</i> <i>"Good research resources centres should be established"</i> <i>'Research centres, research allowances be made available to ease the process'</i> <i>"Creation of research centres."</i> <i>"Multimedia sites and PowerPoint projectors should be installed in school to help students do easy and effective research"</i>
Provision of grants	<i>Provide grants to lecturers and students, sponsor all publications of lecturers or create avenues like MOUs to facilitate cheaper publications"</i> <i>"Students should be assisted financially"</i> <i>"Financial assistance to students be provided"</i> <i>"Students should be given financial assistance by the government to carry out their research programs."</i>
Improve infrastructure	<i>"Improve infrastructure and fund research"</i> <i>"Set up labs and give funding to these labs"</i> <i>"Universities should get more grants and build laboratories and workshop to carry out research adequately"</i> <i>'Good research is driven by adequate funding and infrastructure'</i>
Improve evaluation	<i>"Better evaluate research"</i>
Online publication	<i>"Students should be encouraged to publish their projects online."</i>
Implementation of results	<i>"Results should be implemented and not end up on paper."</i> <i>"Results from research should be implemented"</i>
Innovation and digitalization	<i>"Innovation and digitalization"</i> <i>"Digitalisation of research and team work'."</i>
No plagiarism	<i>"Students should stop the plagiaristic nature when it comes to research"</i>
Sensitization	<i>"Educate both students and lecturers on the importance of research."</i>

Collaboration among supervisors		<i>"I recommend that supervisors stop quarreling among themselves."</i>
Change research methodology	in	<i>"I think the method of research should be changed."</i>

Based on recommendations to improve on research output, participants reiterate the need for change in a research paradigm, many said funding and increased research allowance be made available and the funding of research projects should adapt to national problems stating that *"greater funding should be made available for researchers"* which will enable valorization of research results. That research equipment such as computers be provided, well-equipped laboratories and books be made available stating *"The university and the government should help young researchers with adequate materials that they need for research"* and *"Well equipped computer labs, should be created for computer students in order to help them do effective practical and even research."* That regular seminars/capacity building programmers on research be organized for lecturers and students that will create a forum to learn and increased research training (Akuegwu, Nwi-ue, & Eno, 2013). Also, many of the lecturers said research equipment such as computers, well equipped laboratories and books. The need for well-equipped laboratories, computers, and access to books is crucial for conducting high-quality research. According to Tan and Teo (2013), inadequate research infrastructure can hinder the productivity and effectiveness of researchers, limiting their ability to address local challenges and contribute to national development.

Others said there should be regular seminars/capacity building programmers on research be organised for lecturers and students, research carried out should reflected local realities by solving the problems within the context. Lecturers and students require continuous capacity building programs and seminars to enhance their research skills and stay updated with the latest methodologies and practices. Research should reflect local realities and address the specific challenges within the context of Cameroon. This notion is supported by Mansilla and Jackson (2011), who argue that research should be contextually relevant to effectively address societal issues and contribute to sustainable development.

Also, adequate supervision of students by supervisors be carried out, supervisors should be kept

aside personal grudges when supervising students, access to and partnership should be increase, good internet and free internet connection be provided, lecturers and students be motivated, well equipped libraries be provided, research centers be created, need for collaboration and research grants be provided to lecturers and students. Effective supervision is essential to guide and support students throughout their research work. Kiboss (2014) highlights the significance of proper supervision in facilitating quality research outcomes and the overall success of students' research projects. connectivity, well-equipped libraries, and research centers, is necessary to foster a conducive research environment. Collaboration and partnerships with external organizations, industry, and other institutions can also enhance research relevance and impact. These ideas are reinforced by Altbach and Salmi (2011), who emphasize the importance of creating a supportive research ecosystem through access to resources and establishing networks for collaboration. Providing motivation and incentives to lecturers and students can help drive research productivity and engagement. Ramasamy, Ahmad, and Yusoff (2011) explore the motivational factors that influence academic researchers, highlighting the importance of recognition, career advancement, and financial rewards.

Other recommendations advanced to improve on research output are that infrastructure be improved, method of evaluation be improved as well, online publication be encouraged, results of research be implemented, innovation and digitalization be adopted, no to plagiarism, students and lecturers be sensitizing on the importance of research, supervisors should collaborate among themselves, and research methodology be change.

Changes in research activities expected in university institution

The table below depicts administrators' opinion on changes in research activities expected to improve on research output for the enhancement of relevance in higher education.

Table 3: Administrators Opinion on Changes in Research Activities Expected

Themes	Quotations
Research seminars/workshop	"There should organise research seminars to boss dissemination research results" "Improvements at the level of organisation of research seminars" "More seminars, workshops on projects should be organized by the universities" "Improvement at the level of organizing workshops" "More research seminars and workshop should be organized to aid the dissemination of research result" "More workshop should be organized on research"
More grants	"More research Grant should be given not only to staff but also to students to boost their spirit which will enable them solve society problem" "More research allowance should be allocated to lecturers for further research" "More research grant should be given to improve on our research findings"
Improved internet connection	"Improvement on internet connection speed in universities" "Effective Wi-Fi networks should be made available on all corners of the campus to facilitate to facilitate research" "Construction of modern classrooms with computers, provision of Wi-Fi so that students can have access to research"
Research Centre and library	"Make libraries and research Centers for students" "Equipment of libraries, laboratories, and applied research centers" "Create libraries and research sites for students " "Create libraries and research centers"
Implementation of results	"There should be effective implementation of research results because it's done just as a routine" "Universalization of scientific research".
Own a publishing house	"Universities should own publishing houses or journal to easy the publication of research works and results" "Each university should have a publishing house in other to disseminate research findings"
Digital research	"Online or digital research should be introduced" "Improve access to ICT research tools in state universities"
Equipping research laboratories and facilities	"Optimization of the research laboratories" "Improve research facilities like internet and electricity"
Increase funding	There should be in increase in research assistant or funding
Reflect contextual realities	"Our research should be grounded that is based on our own contextual problem"
Transparency	"There should be transparency in the allocation of research resources"
Employed competent research teacher	"Good research lecturer should be brought in"
New research methodology	"New research methods should be discovered"

Based on changes expected in university research by the administrators, many of them said more workshops and seminars on research be frequently carried out, more grants be provided, good internet connection be provided, research center and library be provided, research results be implemented, the University should own a publishing house. Administrators emphasize the importance of organizing frequent workshops and seminars on research. Such events provide opportunities for researchers to enhance their skills, exchange knowledge, and stay updated with the latest developments in their respective fields. Cheng and Kuo (2016) emphasize the significance of professional development programs, such as workshops and seminars, in improving research productivity and quality. The provision of more research grants is crucial to

support researchers in conducting high-quality research. Financial support enables researchers to access resources, conduct experiments, and disseminate their findings. A study by Altbach and Salmi (2011) highlights the importance of adequate funding to foster a vibrant research environment and promote cutting-edge research. Administrators emphasize the importance of implementing research results to address societal challenges and contribute to national development. The practical application of research findings is crucial for ensuring their relevance and impact. Mansilla and Jackson (2011) argue for the integration of research and practice to foster sustainable development. The establishment of a university publishing house can facilitate the dissemination of research findings and promote knowledge sharing. It can provide researchers

with platforms to publish their work and increase the visibility and impact of their research. The significance of university publishing houses in supporting scholarly communication (Altbach and Salmi, 2011).

Also, others said digital research be promoted, research laboratories be equipped and facilities provided, funding be increase, research carried out should reflect contextual realities, new methodology be adopted, competent teachers in research be employed and there should be transparency in the use of research resources. The importance of promoting digital research is emphasized by the respondents. Digital research encompasses various aspects, including utilizing digital tools, online resources, and digital data analysis techniques. The use of digital technologies in research can enhance efficiency, collaboration, and accessibility. According to Weller (2011), digital research practices and tools have the potential to revolutionize the research process and increase the impact of research outcomes. The call for increased funding aligns with the need to provide researchers with adequate financial resources to

support their research activities. Adequate funding enables researchers to conduct experiments, access resources, and disseminate their findings. Geuna and Martin (2003) highlights the positive relationship between research funding and research productivity. The importance of research that reflects contextual realities is emphasized by the respondents. Contextualized research addresses local challenges, societal needs, and contributes to the development of the community or region. Mansilla and Jackson (2011) argue that research should be grounded in local contexts to effectively address real-world problems and promote sustainable development.

If changes in research paradigm (approaches, method and funding) will improve the relevance of higher education

The figure below depicts administrators' opinion if changes in university research activities would enhance higher education relevance in higher education.

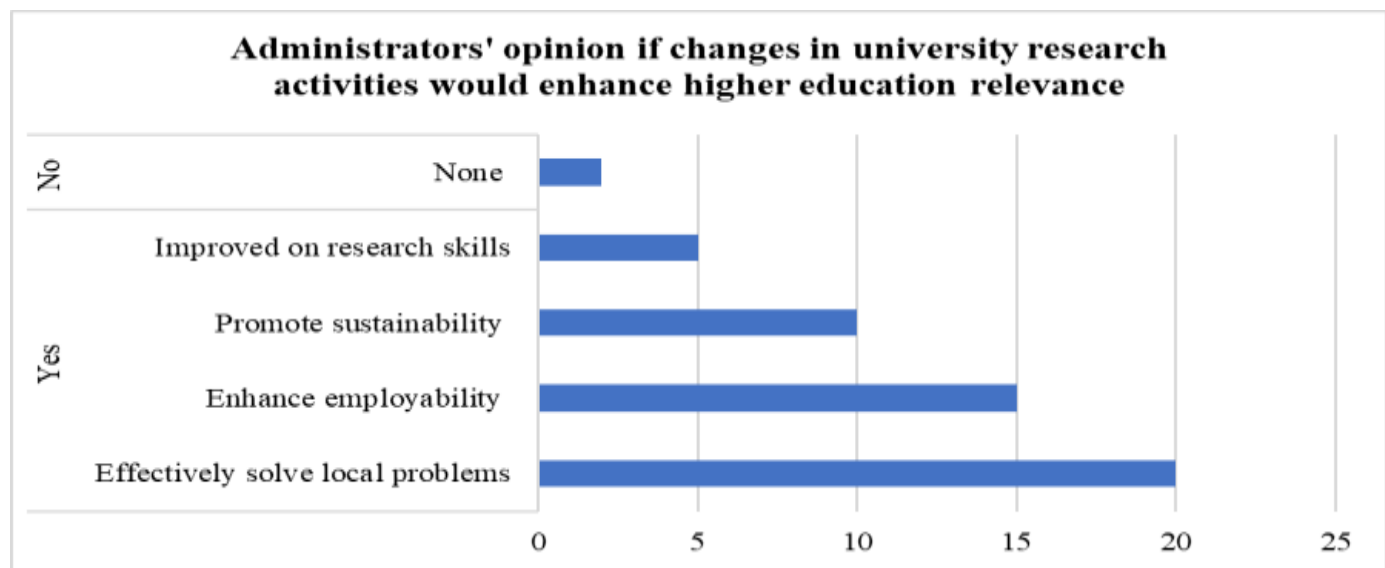


Figure 1: Administrators opinion if changes in university research activities would enhance higher education relevance

In line with administrators' opinion if changes in university research activities would enhance higher education relevance, almost all of them said "Yes" pointing out that changes in university research activities will effectively solve local problems categorically stating "Yes if we carry out research in our area of interest it will help the best solve our local problem; Yes, it will meet demands in the society; if we implement research findings which it is aim at solving problem, there will be relevance; To an extent, there is little improvement in problem solving; Yes, changes in research activities will meet up with contemporary changes issues." Conducting research that directly addresses local problems and challenges is crucial for ensuring the relevance and impact of higher education institutions. By

focusing on issues that are pertinent to the local community, researchers can generate knowledge and solutions that have practical applications. This notion is consistent with the concept of engaged scholarship, which emphasizes the importance of connecting academia with society and actively addressing societal needs (Boyer, 1990). The implementation of research findings can lead to positive changes in society, such as policy development, improved practices, and enhanced services. The significance of research implementation in achieving societal impact is discussed in various studies, including Weiss (1979) and Nutley et al. (2007).

Others said changes in university research activities will enhance employability "Students who carry out grounded research in their area of study and are

sponsored will help them best implement the results by creating jobs for themselves. Research-based learning gives students hands-on experience in applying the epistemologies, methodologies and modes of dissemination of a particular discipline. "Students who engage in grounded research in their area of study and are supported through sponsorship can effectively implement the research results by creating Job opportunities for themselves. This aligns with the notion that research activities can foster entrepreneurship and innovation, leading to the creation of new ventures and employment opportunities. Research-focused entrepreneurship is discussed in studies such as Guerrero and Urbano (2012), which explore the relationship between research and entrepreneurship.

Furthermore, many of the administrators said change in research paradigm will promote sustainability and improved on research skills categorically stating *"it will increase research works for students and teachers help them to acquire information or knowledge that will help them cope with their various professions and enable sustainability; A change in universities research paradigm will expose students to improve on their skills*

and to have an in-debt understanding in their field of study; It will encourage young researchers to do more; and at the level of students' supervision on their projects and dissertation writing, it will bring an improvement since there is regulation in students giving bribes to supervisors." Sustainability implies a shift towards research that addresses environmental, social, and economic challenges, promoting sustainable development. The relationship between research and sustainability is discussed in various studies, such as Leal Filho et al. (2018), which explores the role of higher education institutions in promoting sustainable development. A shift in the research culture and support systems within universities can create an environment that fosters and nurtures the research aspirations of young scholars. The importance of supporting and encouraging young researchers is discussed in studies such as Austin et al. (2012) and Salmi (2014).

Verification of Hypothesis: There is no significant relationship between change in research paradigm and the enhancement of relevance of state higher education system in Cameroon.

Table 4: Relationship between Change in Research Paradigm and the Enhancement of Relevance of State Universities

		Change in research paradigm	Enhancement of higher education relevance	Explanatory power of relationship in terms of percentage (Nagelkerke statistics)
Spearman's rho	R-value	1	.458**	87.2%
	p-value	.	.000	(0.872)
	N	1718	1718	

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

The hypothetical statistics showed that there is a significant, positive and strong relationship between change in research paradigm and the enhancement of relevance of state Universities (R- value 0.458**, p -value $< 0.001 < 0.05$). The positive sign of the correlation value implies that changes in research paradigm will contribute to the enhancement of higher education relevance and this is supported with a high explanatory power of 87.2% (Nagelkerke statistics= 0.872) and this was also accepted by 83.3% (1431) of lecturers with some participants saying that *"Changes in research paradigms can improve the relevance of higher education if suitable to the actual challenges we meet in the country. That is, appropriate research policies can help resolve the common problems we face (societal problems), motivate researchers to go extra mile and exploit other fields, help the University to adapt to changing environment and will help the Universities to be ranked on the international space based on the amount of research work and publication output."* Another participant adds *"More funding will surely improve the quality and quantity of research output in our universities, better inform policies,*

better contextualize Higher Education and that most universities are recognized from the quality of articles published". Also, a participant said *"Changes in research paradigm would improve since the increase in funding encourages the researchers and make it easy for them to get an internet connection and can buy required books. Making an approach easier will ease stress and encourage research"*. Thus, the null hypothesis was rejected while the alternative that states there is a significant relationship between change in research paradigm and the enhancement of relevance of stage higher education system was accepted. The educational change model by Fullan (1940-Present) provides a systematic approach to aligning research priorities, teaching methods, curriculum, and institutional policies, promoting interdisciplinary collaboration and addressing societal needs. Fullan's emphasis on capacity building enables universities in Cameroon to develop the necessary skills and competencies among faculty members, researchers, and students to conduct applied research and effectively communicate findings. By applying Fullan's educational change model, universities

can transform their research efforts, build capacity, and provide effective leadership, ultimately enhancing the relevance and impact of the state higher education system in Cameroon.

CONCLUSION AND RECOMMENDATIONS

Based on the findings, the study highlights the need for change in research paradigm to meet the changing needs of society. This requires the need for improvement in research output and for research in higher education to fosters innovation. Societies and communities face a variety of complex challenges that require innovative solutions. These challenges can range from social, economic, and environmental issues to technological advancements and health crises. To address these challenges, universities and higher education institutions need to adapt and align their research efforts with the changing needs of society (Etzkowitz et al., 2014). Research in higher education plays a crucial role in fostering innovation by generating new knowledge, developing novel approaches, and driving technological advancements. By fostering a culture of innovation, universities can contribute to economic growth, social progress, and sustainable development (Baker et al., 2018). To achieve this in Cameroon, it is recommended that research seminars/workshop, more grants, research centre and library, research results implemented, and research should reflect contextual realities. As Changes in research paradigms can improve the relevance of higher education if suitable to the actual challenges we meet in the country. As appropriate research policies can help resolve the common problems we face (societal problems), motivate researchers to go extra mile and exploit other fields, help the University to adapt to changing environment.

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