

The Extent and Economic Impact of Research and Innovation in Zimbabwe's Higher Institutions of Learning

Silvanos Chirume¹ & Rosemary Ngara²

¹Department of Mathematical Sciences, Zimbabwe Open University, Midlands Regional Campus

²Department of Teacher Development, Zimbabwe Open University, Midlands Regional Campus

DOI: <https://dx.doi.org/10.47772/IJRISS.2024.8110091>

Received: 18 September 2024; Accepted: 25 October 2024; Published: 05 December 2024

ABSTRACT

There has been talk at different fora that in order for Zimbabwe to reduce poverty and increase its gross domestic product, there is need for its higher institutions of learning such as universities and colleges to focus more on research, innovation, and industrialisation. While this might be a noble idea, it remains to be seen to what extent Zimbabwe's higher institutions of learning have actually realised this goal and what has been its overall impact on the economy. Using a qualitative research approach and an interpretivist paradigm, this study investigated the issues of research and innovation at four higher institutions of learning in Gweru Urban district, Zimbabwe. Data were collected through the institutions' research repositories and innovation hubs and were critically analysed using document and content analyses. In order to solicit more opinions and suggestions, follow up interviews were also carried out with the institutions' purposively selected research chairpersons responsible for research and innovations. This study found that although different institutions seemed to view and measure the impact of research and innovation in different ways, they also agreed that research and innovation are of utmost importance to the individual, to the institution and to the country at large. Proposals for staff training, sufficient funding and policy formulation related to research and innovation, among others, were made. However, there was no sufficient evidence to answer the question 'to what extent research done by Zimbabwe's institutions of higher learning have impacted on the economy,' implying that further research needs to be done. Nevertheless, findings and recommendations emanating from this study may be used to inform higher institutions of learning in the district and in Zimbabwe at large to come up with appropriate policies and programmes that help to realise the UN Sustainable Development Goals (Goals 1, 8 and 9) and help to make Zimbabwe an upper middle economy by the year 2030.

Keywords: impact, research, innovation, industrialization, commercialisation, innovation hub, higher institutions of learning, sustainable development goals.

INTRODUCTION AND BACKGROUND TO THE STUDY

There has been talk at different fora that in order for developing countries such as Zimbabwe to reduce poverty and increase their gross domestic product (GDP), there is need for their Higher Institutions of Learning (HIL) such as universities and colleges to focus more on research, innovation, and industrialisation. The UN Sustainable Development Goals related to these ideas are: Goal 1 - End poverty in all its forms everywhere, Goal 8 - Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all, and Goal 9 - Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation (UN General Assembly, 2015). However, a key question to be asked is how Zimbabwe's economic growth can be sustained through research and innovation and how the impact of these can be measured (Jones & Rees, 2018; Cheah, 2016).

According to The World Fact Book (n.d) and Zimbabwe Economic Outlook (n.d), Zimbabwe has strong foundations for accelerating future economic growth and improving its people's living standards. Zimbabwe was once the breadbasket of Southern Africa (Nyakwawa, 2017; Macheke, 2019), but now there has been some economic decline since 1995, coupled with macroeconomic volatility, monetary instability, and substantial exchange rate distortions. For instance, when the new currency (Zimbabwe Gold or ZiG) was

introduced in April 2024, it was pegged at about 13.56 to the US dollar but now it is around 27.6869ZiG to the same US dollar on the official rate and at almost 40ZiG to 50ZiG to one US dollar on the black market or informal sector rate as at 21 October 2024 (Dzoma, 2024).

Zimbabwe's real GDP growth is estimated to have been 5.5% in 2023, driven by expansion in agriculture, mining, and remittances-induced services growth. Inflation remains a concern, with annual inflation increasing from 26.5% in December 2023 to 47.6% in February 2024 due to local currency depreciation. Fiscal pressures increased in 2023, and the credibility of the 2024 budget is in doubt according to the World Bank in Zimbabwe (n.d.).

On the outlook, slower GDP growth of 2.0% is projected for 2024 due to below-average agricultural output caused by the El Niño weather phenomenon. Mining output is also expected to remain subdued due to lower international mineral prices. Inflation is projected to average 24.9% in 2024 as the exchange rate stabilizes. Risks include droughts, unstable commodity prices, and a slowdown in global economic growth. Despite the challenges, Zimbabwe has abundant mineral resources and relatively strong human capital, comparable to upper-middle-income economies in Sub-Saharan Africa. Thus, it may be necessary for the country, through research and innovation, to address macroeconomic instability and implement reforms which will be crucial for sustained growth and improved living standards.

Higher Education Institutions (HEI) play a crucial role in advancing sustainable development, both globally and within specific countries like Zimbabwe. Below is an exploration of how HEI contribute to sustainable development: ([https://www.academia.edu/124466350/Promoting sustainable development goals Role of higher education institutions in climate and disaster management in Zimbabwe](https://www.academia.edu/124466350/Promoting_sustainable_development_goals_Role_of_higher_education_institutions_in_climate_and_disaster_management_in_Zimbabwe))

1. Education for Sustainable Development (ESD):

- HEI are essential for promoting ESD. They allow every individual to acquire knowledge and skills necessary to shape a sustainable future.
- By integrating key sustainable development issues into teaching and learning, HEI prepare students to address real-world challenges related to sustainability.

2. Climate Change and Disaster Risk Management:

- HEI in Zimbabwe have actively engaged in climate change education and disaster risk management (DRM).
- These institutions contribute by:
 - a. Providing education on climate change adaptation and resilience.
 - b. Conducting research on climate-induced natural disasters (CINDs).
 - c. Developing policies and strategies to mitigate the impact of disasters.
 - d. Training professionals who can respond effectively to climate-related challenges.

3. Quality Education and Lifelong Learning:

- HEI play a vital role in providing quality education and promoting lifelong learning opportunities.
- By updating curricula, pedagogy, and educational resources, HEI can address the twenty-first-century context of teaching and learning, ensuring relevance and quality.

4. Economic Impact and Sustainability:

- Establishing HEI in declining resource-dependent towns can transition these towns into sustainable and vibrant urban centres.

In summary, HEI contribute to sustainable development by fostering quality education, addressing climate change, promoting disaster risk management, and supporting economic growth.

Justification and Significance of the Study

While the idea of focusing more on research, innovation, and industrialisation might be a noble one, it remains to be seen to what extent Zimbabwe's HIL have actually realised this goal and what has been the overall impact on the economy. Thus, these views prompted the undertaking of this research. The study might raise awareness of top management of HIL regarding challenges of embarking in research, innovation and industrialization and how to overcome them. Zimbabwe's HIL might also come up with policies and programmes that help to realise some of the UN Sustainable Development Goals as articulated above and in line with the Government's vision of making Zimbabwe an upper middle economy by the year 2030 (Government of Zimbabwe, 2018).

Purpose of the Study

The study seeks to investigate to what extent Zimbabwe's HIL have focused more on research, innovation, and industrialisation. It also seeks to examine the HIL's overall impact on the economy.

Research Questions

The following critical research questions informed this study:

1. What is the status of Zimbabwe's HIL with regards to research, innovation, and industrialisation?
2. In what ways can research publications and innovations done at Zimbabwe's HIL influence or impact on the country at large?
3. What has been the overall impact of research and innovation at Zimbabwe's HIL to the country's economy?
4. What kind of research-related policies and programmes can Zimbabwe's HIL come up with in order to increase the country's GDP and make it an upper middle economy by the year 2030.

REVIEW OF RELATED LITERATURE

Conceptual framework

The Essence of Impact

Impact can be viewed as a change to status quo or as a means to preserve the status quo (Jones & Rees, 2018). It refers to "positive and negative, primary and secondary long-term effects produced by a development, directly or indirectly, intended or unintended (Jones & Rees, 2018 citing OECD-DAC, 2010). According to Chiome et al., (2013) impact refers to actual change of behaviour. Several variables need to be considered in defining impact. Types of impact need to be considered. The types may be categorised as social, economic, environmental, strategic and financial. Dimensions are among the matrix of variables needed to define impact. Dimensions fall into the following categories: intellectual, institutional, political, people, cultural and behavioural. Magnitude or scope of impact is another variable that should be considered in defining impact. Impact may be small-scale, medium scale or large scale. In addition, time scales are a variable upon which definitions of impact should hinge. Impacts of research and innovation can be immediate or medium or long term. All these factors can be direct or indirect, tangible or intangible, positive or negative and be experienced differently across several subgroups of people (Jones & Rees, 2018). There are actors in the impact system and several determinants of economic players (Jones and Rees, 2018; Popa, Preda & Boldea, n.d). They include civil society, donors, funding agencies, media, private sector, researchers, development or innovation implementers and Government bodies. All actors have roles to perform in influencing the nature and scope of impact. There are incentives that drive actors and there exist links between the different actors. Impact is about people. The impact system depends upon diverse and changing groups of people who are involved in the realisation or non-realisation of the impact of research and innovation. Relationships and collaborations must be built between actors in the research and innovation system (Jones & Rees, 2018; Cheruto, & Chepchumba,

2017.

Measurement of Impact of research and Innovation

On one hand research “... is a systematic investigation carried out to discover new knowledge, expand existing knowledge, solve practical problems, and develop new products, applications and services.” Research is very important for advancing knowledge, solving problems, informing decision-making, fostering innovation, promoting critical thinking, and determining the economic, social and political development of a country (Moxley, n.d., Rajasekar, Philominathan & Chinnathambi, 2013), while on the other hand innovation is simply the introduction of something new be it an idea, a method, a skill, a device or an instrument. Innovation is not a decision but an ecosystem that is a foundation for knowledge societies and sustainable development (UNESCO, 2014, p. ix, Popa, Preda & Boldea, n.d).

According to Cheah (2016) there is no single indicator that can provide a complete picture of economic impact of public funded research. There are different measures of research impact and these include academic outputs such as citations, innovation inputs, social and behavioural change (Cheah, 2016; Research Council of Zimbabwe, 2018). Basic research is typically evaluated by measures such as publications and citations whereas applied research (like technology transfer and innovation) can be measured by licensing income and patents. However, “... these metrics often underestimate the productivity of researchers in low- and middle-income countries and reflect disparities in scientific funding and infrastructure” (Jones & Rees, 2018, p.2). Improved health and quality of life and economic outcomes are difficult to measure.

Hence, alternative impact-measurement approaches can be used. For example, impact can occur in terms of content (policy, legislation), discourse, attitudes, behaviour and/or approach. So, impact can also be measured using a scale or ladder, impact case studies, randomized controlled trials, quasi-experimental designs, (to measure development outcomes and attribute them to particular interventions), such as education reforms, agricultural programs and so on.

In an increasingly interconnected world, relying on citations as a measure of research success is no longer enough Cheah (2016). There is need for a long-term system-based approach since research and innovation function in a system of multiple stakeholders, not just academia and government. Applied research such as technology development and innovation is often measured by licensing income, patents and other measures of technology transfer. These measures often underestimate the productivity of research in low- and middle-income countries and show disparities in scientific funding and infrastructure (Jones & Rees, 2018).

Some principles and methods need to be considered in measuring research impact. Jones and Rees (2018) suggest the following:

- i) an appropriate and complementary blend of qualitative and quantitative evidence and impact indicators can extremely be helpful in understanding impact.
- ii) contribution analyses can help to identify and disentangle impact. These include Tracy Study and rapid outcome assessment.
- iii) to include impact at the forefront of research and innovation program planning
- iv) necessary to understand and categorise level and timing of impact
- v) participating in larger networks can increase the impact of research or innovation.

Impact of research and innovation can also be shown by growth in GDP. Literature has shown that “there is a high correlation between the number of publications per million population and GDP per capita in different countries” (UNESCO, 2014, p. 65 citing Konrad and Wahl, 1990; Ye, 2007). Methods for measuring this correlation exist but it would appear that in Zimbabwe, this correlation does not exist.

Challenges in taking research and innovation to impact

It is not easy to take research and innovation to impact and measure successes, failures and lessons meaningfully. “Time, financial and award constraints limit the opportunity for learning around impact” (Jones & Rees, 2018, p.8). Time- scale is a challenge in measuring and identifying research and innovation impact; moreover measuring longer-term societal impacts. It is difficult to obtain dependable and quality data and this is an obstacle in measuring impact. There are barriers to effective communication which is a requirement for effective measurement of impact. Communication should be well targeted and specific to different types of stakeholders. “Lack of coordination at the national level, a lack of cooperation by research institutions, universities and businesses, and a generally weak statistical system in the country” (UNESCO, 2014, p. xix), and poor accounting systems, no adequate policy instruments to promote research and innovation, for instance in Zimbabwe, lack of resources and poor implementation strategies are other constraints.

Contextual framework

What obtains at Higher Education Institutions

Major roles performed by members of research committees

Different positions held by members of research committees and sub-committees and levels for which research committees represent, influence committee member roles. Research committees are often made up of chair, methodology expert, content experts and research review member (Gelling, 1999), and this varies from one institution to another. Generally, research committees have a dual responsibility, namely, to provide service to students and to give service to the academic practice, discipline and professional field to which is research is related. The chair leads, coordinates, and assesses the progress of research from start to finish. The methodology expert and content expert give input in their areas of expertise. The Dean of International and Graduate Studies ensures that suitable general training is available for all new supervisors, for chairs and internal examiners. They also monitor the rules of ownership of intellectual property arising in the work of students and setting the requirements for compliance with respect to ethical standards and procedure. According to Gelling (1999) institutions in the health sector set up Research ethics Committee. ‘Research ethics committees have an important role to play in ensuring the ethical standards and scientific merit of research involving human subjects’ (Gelling:1999: 564). Three obligations placed on the ethics committee are: ensuring that rights of research participants are protected, obligation to society which provides resources for research and will ultimately be affected by the research results and obligation to the researcher by making sure that the research proposal is treated with respect and consideration.

Innovation hubs: Expected Benefits and perceived impact

An innovation hub is a ‘----zone where creative people and businesses can come together to share ideas and collaborate’ (Zulkifli et al., 2022). According to Innovationquarter.com an innovation hub is a physical space that brings together researchers, creators and innovators to nurture ideas into industry-changing products and services while <https://innovate.unc.edu/> says innovation hubs are generally places where innovators, entrepreneurs, community members and people from universities can collaborate, develop their ideas and bring them to impact. In recent years, the focus on innovation has resurfaced as an important variable in economic development and innovation hubs have become more important as countries strive to rebuild their economies in the post Covid 19 era (ibid.). Innovation is critical in driving economic growth. Zulkifli, et al (2022) are of the opinion that via innovation hubs, companies can reach a large pool of talent and resources. Innovation hubs help foster a culture of innovation and with advanced technology and it is easier for academic institutions and businesses to connect and share ideas.

In a study titled, ‘Scaling Innovation Hubs: Impact on Knowledge, Innovation and Entrepreneurial Ecosystems in Tanzania, Mwantimwa et al (2021) explored the impact of innovation hubs on knowledge, innovation and entrepreneurial ecosystems. The study revealed a noticeable contribution of innovation studied by the researchers, in empowering youths in aspects of knowledge creation and transfer and promotion of diverse innovations. These findings supported Atiase et al (2018) and Cheruto & Chepchumba (2017) who in their

studies established that hubs with a substantial support of new start-ups and firm formation served as sources of employment and platforms for knowledge creation. The findings, nonetheless, indicated that the contribution of the innovation hub in transforming innovations into entrepreneurial opportunities was unsatisfactory. In addition, the findings suggested that not all start-ups emanating from the hub under study were taking off. Undermining variables such as financial constraints and unfriendly legal frameworks prevented take-offs.

Challenges faced in the bid to promote research and innovation

Securing funding to pay for research is a critical hurdle, to get a research project to start and earning the trust of potential funders, often presents itself as a challenge (Kumwenda et al., 2017; Polonetsky, 2014 & Olukoju, 2002). In support of this view, Joosten, et al., (2016) opine that in the absence of sound monetary incentives, incentivising participants presents itself as a challenge to research leading to the obstacle of funding enough faculty and student participation. In Africa, for instance, there is little investment in research and University research offices tend to prioritize support to larger grants and academic ‘rock stars’ (Olukoju, 2002).

The absence of scientific training relevant to all critical aspects of research is another challenge. There is lack of standardisation in the research process for Distance Education (DE) and a top challenge for DE research is translating the research plan into actual implementation at designing stage, data collection and analysis stage for DE studies (Joosten et al., 2016). Absence of adequate training results in low levels of research uptake. For instance, absence of sound training may lead to failure in building a great team where collaborators and advisers are needed and building a great team may be complicated, more so if the research area or topic is multi-disciplinary (Polonetsky, 2014). As a result of lack of training, many students and a good number of their lecturers may have difficulty in developing noble research ideas (Polonetsky, 2014). Researchers also lack writing skills (Kumwenda et al., 2017).

According Joosten et al., (2016) research is team-based yet many institutions do not encourage team-based projects.

Research is faced by other competing priorities and there is general failure to find enough time for all the activities to conduct and manage research as would be researchers invest their time to teaching, community services and other administrative tasks (Polonetsky, 2014; Joosen et al., 2016 & Horberry, 2021)

Demonstrating research impact effectively is not easy. Demonstrating the value of research projects is important for the reputation of the institution and the researchers as well as for justifying future external and internal resource allocations. However, methods of meaningfully measuring research impact are unclear and impact is something only evident over time (ExLibris, 2019). Promotion of research and innovation may also be hindered by ideological commitment and intellectual capacity of the researchers or of their institutions (Mpeperek, 2019).

Strategies and policies for meaningful successes to be witnessed in the area of research and innovation

To promote success in research and innovation, Gelling (1999) suggests ensuring that suitable general scientific training is made available for all new supervisors, chairs and internal examiners. In harmony with this view Olukoju (2002) proposes establishment of mentorship programmes in research.

For innovation hubs to contribute to national innovation systems, deliberate efforts must be made and strategies put in place by different stakeholders such as government, diversification of funding sources is important, not to just depend on international development funding agencies and organisations (Mwantimwa et al., 2021). Grants specifically targeting young scientists would be beneficial (Olukoju, 2002). Participants in a previous study (Chirume & Thondhlana, 2018) suggested that the government or the country at large should come up with a policy on entrepreneurship curriculum for universities. Entrepreneurship education was envisaged to incorporate ‘hands on’ or practical activities such as clay pot making, basket weaving, computer simulation and algorithms, mathematical modelling of real-life objects, among others. Artefacts and innovative objects created by the students would be sold to generate money for themselves or for their communities.

Students and their lecturers could also offer consultancy services to needy companies or individuals. Universities and colleges would collaborate and work together with industry and other interested stakeholders (Barrichello, dos Santos, and Morano, 2020). All these activities and initiatives would contribute to the country’s GDP.

MATERIALS AND METHODS

Using a qualitative approach and an interpretivist paradigm, this study investigated the issues of research and innovation at four conveniently sampled HIL in Gweru Urban district, Zimbabwe. To collect secondary data, the researchers visited the websites of the four different institutions and typed in the search boxes the keywords: research, innovation, innovation hub, and products. Document analysis was used to analyse secondary data, especially by examining the content that matched the keywords.

In order to solicit more opinions and suggestions, follow up interviews were also carried out with the institutions’ four purposively selected research chairpersons or other staff members responsible for research and innovations. These chairpersons were senior lecturers and experts in their fields of work and were judged to be able to provide authentic information for this research. The Delphi method was used (Barrett & Heale, 2020; Ashmore, Flanagan, Mcinnes, & Banks, 2016; Ogbeifun, Agwa-Ejon, Mbohwa, and Pretorius, 2016). The participants did not know each other, and their individual contributions were treated in confidence. The participants only willingly responded to the questions at hand and to the rounds that were conducted.

Firstly, personal interviews were separately conducted with each of these participants and their responses were collated/summarised. Secondly, their responses were sent to them to check for correctness and clarity. The participants made comments, which when checked for this second time, agreed with the researchers’ summaries. A third round was made whereby participants checked and commented on theirs and also on one another’s responses. It was noted that there were similarities and consensus between the participants’ final viewpoints (apart from using different words to mean similar things). Thus, it could be established that the participants, though few in number, provided authentic information that answered the research questions.

For primary data, the questions in the interview protocol, apart from demographic data, focussed on the number and type of publications, impact of the publications, status and effects of innovation hubs, challenges faced vis-a-vis research and innovation at the institution and how to overcome the challenges.

RESULTS AND FINDINGS

Table 1: Demographic data of the interviewees (Questions 1, 3, 4)

	Gender (Q1)	Age (Q1)	Dept (Q1)	Experience (Q1)	Publications by one member (Q3)			Publications by all staff (Q4)		
					pm	ps	py	pm	ps	py
HIL1	M	57	Math/Stat	16	0	0	1	0	0	15
HIL2	F	55	Education	8	0	1	2	-	24	-
HIL3	M	53	Management	30	-	-	2	-	-	-
HIL4	M	59	Language Institute	3	-	1	2	33	200	400

Key: pm = per month, ps = per semester, py = per year, - = not known

Table 1 shows that all the respondents were above 50 and below 60 years of age with one member having as many as 30 years of experience and yet another having only 3 years of experience. From all the 4 institutions,

there was an average of 2 publications per member per year while it seemed difficult for any member to produce a single publication in a month. Such a failure could be attributed to the prevailing economic hardships being faced by the generality of academics in Zimbabwe. HIL 4 had the biggest number of publications per semester and per year, probably indicating that it was well supported or well-resourced in terms of research. HIL 3 was the weakest in terms of research and publications.

Question 2 asked the interviewees about their roles as members of research committees. These were stated as follows:

HIL1: (a) Coordinating and chairing research workshops and presentations (b) Writing research reports for the head of institution... (c) making members aware of call for papers and encouraging them to prepare and submit papers to different journals.

HIL2: Selection of appropriate candidates for MPhil and DPhil, allocating supervisees to supervisors, supervising students.

HIL3: Researching, presenting conference papers and publication of papers.

HIL4: Contributing to the formulation of policy on all research related matters which impact on the strategic objectives of the University, considering and making recommendations on matters of policy relating to research including matters referred to it by Council and other University committees, To review and oversee the implementation on University's policy on research ethics.

It would appear that research committee chairpersons at HIL1 and HIL2's mandate was more centred on coordination and supervising research activities while HIL3 would focus more on publishing papers and presenting them at conference fora. HIL4 seemed to concentrate more on formulation and implementation of research policies for the university, but it was not clear whether these policies were already in place. Differences in the perceived roles of research committee members could be attributed to the differences in the perception of the importance of the stated roles and guidelines given in each institution's research policy documents.

Question 5 asked about the type of the publications and the results are shown in Table 2

Table 2: Type of publications

HIL1	Basic research (such as on opinions, attitudes, comparisons, statistical test, behaviours) and applied research (such as on problem solving, mathematical modelling, curriculum proposals, solving community challenges, etc.)
HIL2	Educational papers in various disciplines
HIL3	Research which mainly covers: women participation, entrepreneurship, Innovation & industrialisation, Indigenous knowledge systems, Sustainable economic development
HIL4	Original research, review articles, book reviews, clinical case studies and clinical trials

It would appear, from our own interpretation, that HIL1, HIL3 and HIL4 had their types of publications linked to problem solving, economic growth and innovation while HIL2 seemed to be centred on knowledge creation in the area of education. It would seem that publication efforts were directed at addressing economic woes in the country and so researchers were moving along with current economic trends in Zimbabwe.

Question 6 asked about the influence, effect or impact of research publications and the results are summarised in Table 3 below.

Table 3: Influence/Impact of the publications (Question 6)

Influence/Impact of publications	To the author	To other researchers	To the institution	To the country at large
HIL1	Have aided/led to his/her promotions	Have motivated other researchers to research and publish too	(a) Have raised the status and ranking of the institution (b) Publications would/can attract donors (c) Have led to research collaborations	(a) Are likely to put the country on the world map (b) Publications can attract donors (c) Have aided research collaborations
HIL2	-Has feeling of contentment and aims to write more	- Has been inspired to also publish	- Have raised the standard	- Have been made aware of problems encountered in the teaching and learning context and finding ways to resolve them
HIL3	-Increases research abilities and brings solutions to our economy - Leads to economic and social development	- Have been capacitated through research to look for solutions to problems affecting the nation	- Improved academic profile	-Have stimulated innovation and industrialisation in the country
HIL4	- Kept abreast with developments in the academic field. - Have increased work visibility among other researchers - Preserved researcher's work in permanent records of research in the field -Expanded the researchers' professional network - Increased potential for collaboration/interaction with peers	-Prevent waste and increase efficiencies -Avoid unnecessary duplication of efforts. -Researchers and practitioners with similar interests become aware of new knowledge in their field -May apply methodologies, instruments etc. in new contexts & ways the researcher never thought of	-Increased visibility and presence on the Web - Improved university's rankings ie., University being ranked favourably among other local and international universities. -Repositories publicise an institute's research strengths, providing maximum return on research investment	-Provide accurate and timely information on the needs, attitudes and motivations of a population. - Assist Government & business to develop services, policies, and products that are responsive to an identified need -Make decisions on important issues, eg., planning for major transport and infrastructure projects, food security, responses to climate change, taxation policy, etc.

Table 3 shows that different people from different institutions view impact of research and innovation in various and different ways (Jones & Rees, 2018; Cheah, 2016). This again seemed to show that in HEIs, interpretations about research issues are not guided by the same policies. In this study notable examples of impact were cited as individual contentment, preservation of one's work, raising the status and ranking of the institution, putting the country on the world map, attracting donor funding and resources, assisting government and businesses to develop services, policies, and products, bringing solutions to the economy and leading to economic and social development, among others.

The researchers wanted to know whether the institutions had any innovation hubs (Question 7) and the interviewees to state and explain any of these at their institutions (Question 8). The interviewees gave the following information regarding the innovation hubs, ideas, activities and products at the institutions (Questions 7, 8)

According to the interviewees, it was not clear whether HIL1 had any innovation hubs, at HIL3 there was none while at HIL2 and HIL4 the hubs were said to be there. This finding seems to suggest that research information is not disseminated to some HEIs. Some institutions seemed to be in know-how while others were not. However, the interviewees explained the innovation aspects at their institutions as follows:

HIL1: On innovation ideas the interviewee said, "Staff members at the institution talk informally about these innovation ideas, through the group's whatsapp forum." On innovation projects, he said "They exist on paper e.g., honey project but have not been implemented." On innovation activities: "Staff members have ideas, but no activities have been implemented yet maybe due to unavailability of funds and institutional support and top-down management structure," while on innovation products the member said, "nothing at Regional Campus level had been done yet, maybe at National Centre there is something of which we may not be aware of."

HIL2: Innovation ideas include fighting against COVID 19, innovation projects involve production of sanitizers and masks, innovation activities include working in the lab while innovation products include sanitizers and masks.

HIL3: On innovation ideas the interviewee said, "There are a crop of innovators but they need support." On innovation projects: "There is a new incubator as an indication of innovation produced in the institution." On innovation activities it was not clear what the specific activities were but the member said they were "...mainly related in engineering division" while on innovation products only the 'incubator' was mentioned.

HIL4: At HIL4 the **innovation ideas** are centred on nutrition, health and infrastructure. The **innovation projects** include beneficiation and commercialization of indigenous wild fruits, sanitiser making project, production of personal protective equipment and tar making project. The **innovation activities** include the production of indigenous foods, sanitisers, personal protective equipment and tar. The **innovation products** were sated as indigenous foods, hand sanitisers, protective personal equipment and tar.

The interviewees seemed to echo similar sentiments that innovators had important ideas which needed to be nurtured and supported. Products such as the incubator, sanitizers, masks and tar. Commercialisation of indigenous fruits, which has always been done by small scale traders, was mentioned although there could be need to channel more resources and funds towards their value addition. Similar observations were also echoed by Cheruto and Chepchumba (2017).

Question 9 asked, "What has been the influence, effect or impact of these innovations or innovation hubs? The interviewees replied as follows:

HIL1: (a) To the author...Have been an eye opener. Have led to more positive mind-set towards research, production and upliftment, (b) To other researchers ...same as above, (c) To the Institution ...Not much since institution has not produced much. However, if done well they put institutions on the world map.

HIL2: (a) To the author: No answer was given (b) To other researchers: Influenced to come up with more projects, (c) To the Institution: Influenced to come up with more projects, (d) To the country at large:

Development of a nation. When probed further, the interviewee could not explain what she meant by development of a nation.

HIL3: (a) To the author: Source of motivation, expect research support financially, but not so much supported, (b) To other researchers: Source of inspiration, (c) To the Institution: Credit comes to the institution in line with Education 5.0 policy, (d) To the country at large: The genesis of innovation that eventually benefit the nation.

HIL4: (a) **To the author:** They have put their theoretical knowledge to practice, They have created opportunities for the author to collaborate with researchers in other countries and they have provided authors with a third stream income, (b) **To other researchers:** They have been exposed to new ideas which they can use to conduct further research, (c) **To the Institution:** Improved visibility, locally and internationally, Improved rankings among other local and international universities, Improved income through sales from innovative ideas, Availability of personal protective equipment for the institution's staff, and (d) **To the country at large:** Food security to the population, Availability of personal protective equipment for use in the fight against COVID-19, Generation of revenue through sales of personal protective equipment, Saving foreign currency through import substitution measures.

It can be noted that innovation hubs, same as publications have impacted positively on the interviewees, other researchers, the institution and the country at large. This way, it might mean that where hubs have been set up and are working proficiently, researchers and communities are witnessing positive impacts. Notable examples were cited as local and international visibility, knowledge creation, improved income, food security, and economic growth through sales and through saving foreign currency. Cheah (2016) and Langford (n.d.) have also listed similar aspects as direct or indirect impacts of research and innovation.

Question 10 was about challenges faced in the bid to promote research and innovation at the institution. The responses were as follows:

HIL1: (a) No institutional support (b) No institutional funding, (c) No induction/workshop on benefits of research and innovation (d) Not enough time for research due to heavy workloads

HIL2: Lack of resource materials, Lack of cooperation

HIL3: 1 Lack of financial support. 2. Issues of Individual Property Rights (IPR) not clearly articulated to researchers. 3. Interest in research is still very low since benefits ought to be both academic and financial. 4. No funds available to support publications of articles.

HIL4: The pressure to publish in an environment characterised by high teaching loads and inadequate resources and inadequate institutional and external support in terms of providing funding for research activities is the key among the reasons, Various forms of stress have a negative impact on research activities and research output.

By IPR the interviewee at HIL3 meant intellectual property rights. The common challenges noted were lack of funding, big work overloads, lack of support and low morale. All opined challenges relate clearly to the hard economic times, Zimbabwe is going through. These were in support of sentiments echoed by Kumwenda et al. (2017), Polonetsky (2014) and Olukoju (2002).

Question 11: What could be done for meaningful successes to be witnessed in the area of research and innovation? The answers were given as follows:

HIL1: (a) Institutions and top management should support their staff (b) Sufficiently fund research and paper presentations (c) Regularly send staff members for induction workshops on these new visions which crop up (d) Loosen workloads of staff, reallocate workloads fairly and equitably.

HIL2: More workshops on sensitising people on the need for carrying out research.

HIL3: Improve on finance and academic and social support so that research should cause innovation and industrialisation in Zimbabwe.

HIL4: Provide adequate funding for research and innovation, there is need to develop research infrastructure for enhancing research and improving research quality, there is need for comprehensive, goal-oriented and focused research policies at the institutional, regional/state levels as well as the national level, incentivising quality research outputs that adds new knowledge to the existing body of literature.

Training workshops, financial support, research infrastructure and goal-oriented and focused research policies at the institutional and country level were cited as some of the solutions for meaningful successes in the areas of research and innovation. The suggestions which were proffered by participants seem to evolve on the dire need for adequate provision of funds necessary to sufficiently support research endeavours in institutions of higher learning. Suggestions are indicative of financial problems tormenting research efforts in institutions of higher learning. If the challenges are not rectified as observed by Cheruto and Chepchumba (2017), there cannot be any meaningful breakthroughs in the areas of research and innovation.

Secondary Data

Through the institutions' websites or their research repositories, the researchers examined the aims and whether those aims or goals were or are being achieved. However, it was not clear, from the websites and repositories, what teaching or learning approaches and methods would be used to achieve these aims. The information that appeared from the search is summarised below:

At HIL1: The Centre for Research and Innovation (CRI)'s written vision is to inspire the creation of knowledge and innovations that are relevant and empowering.

CRI is responsible for some activities which include identifying scalable, sustainable and high impact multi- and interdisciplinary research and innovation clusters, creating and sustaining an environment that encourages, supports and rewards a vibrant research, scholarship and innovation culture, strengthening the capacity of staff to undertake international quality research that leads to innovation.

Interviewed members, however mentioned the challenge that they were not capacitated in terms of resources and funding (<http://www.zou.ac.zw/aboutus/centre-research-and-innovation>).

At HIL2: There was no information related to our search.

At HIL3: They mentioned that they undertake research for community development. "... (the institution) does not only focus on technological issues but also engages in research aimed at solving social and economic challenges.

For instance, the following innovative products and their descriptions as adopted from the websites, were made by students and staff and would be sold at events such as ZITF (the International Trade Fair). This is part of industrialisation.

1. Masonry Brick Cutting Machine: Used to cut bricks to the required sizes and shapes during construction.
2. Remote controlled Automobile Scissors Jack: Used to change wheels in case of a tyre puncture. Ideal for most female and elderly drivers and easily connected to the battery or the cigarette lighter.
3. Automatic Temperature Controller: Can be applied to control temperature in the greenhouses, or food processing industries.
4. Reversible Afro-centric Ladies Attire: The attire is cost cutting and it reduces luggage for someone travelling.

5. Casual Wear Short for a Wheelchair Bound Person: A knee length ladies casual wear short with a detachable padded back panel for extra comfort for wheelchair bound wearers.
6. Bees Protective Clothing: The bees' protective clothing can be used by bee farmers and bee harvesters who are involved in sustainable development (<http://gwerupoly.ac.zw/research.php>).

At HIL4: The institution's incubation hub launched the roofing and tiling products made out of recycled plastic with the distinct advantages of being lighter, stronger, cheaper and resultantly leading to the creation of a safe and greener world. The institution has seen some of its staff members winning research grants, awards and partnerships. Research collaborations and workshops done would also capacitate staff members in terms of research and innovation. (<https://ww5.msu.ac.zw/blog/category/research/>)

DISCUSSION

This study has highlighted that although different institutions seem to view and measure the impact of research and innovation in different ways, they also agree that research and innovation are of utmost importance to the individual, to the institution and to the country at large. Mere research without creativity, innovation and productivity seems to be of less value. From a study conducted in Tanzania, for instance, it was observed served that "Practical skills and knowledge of doing things practically is more important and more profitable than the sheer mastery of the theory of those same things" (Mufuruki, Mawji, Kasiga & Marwa, 2017, p.64), while the late former president of Tanzania said, "We will have to revamp our educational institutions, build an innovation culture and entrench entrepreneurship in our society" (p. viii).

Several challenges of carrying out impactful research and innovation at HIL such as high teaching loads and various forms of stress were alluded to. These are in agreement with observations of researchers such as Kumwenda et al. (2017) Polonetsky (2014) and Olukoju (2002). To address the challenges, the interviewees gave meaningful suggestions including staff training and induction, funding and supporting research, among others. To corroborate these views, researchers in this study also believe that an innovative and research culture in the younger generation should be imparted. The teaching of innovation should start earlier at primary and secondary school levels and be cascaded upwards. Children should be encouraged to join young scientist exhibition clubs, youth Olympiads, and showcase their talents there. This could raise the impact of education research in Africa (Wolhuter, 2018), or even elsewhere.

As suggested by some of the interviewees in this study, universities and other tertiary institutions of learning should come up with appropriate policies that guide research and innovation programmes, regulations and procedures. Such policies should culminate in an *innovative, entrepreneurial and industry-centred* curriculum for HIL which the researchers hereby propose. Previous researchers have shared the similar proposals (Chirume, 2020; Chirume & Thondhlana, 2018).

Entry requirements: Five 'O' level subjects including English language, at least one Indigenous language and one Science, Technical or practical subject. An advanced level subject will be an added advantage.

Duration and model: 4 years or 8 semesters

Delivery Mode: (Blended) i.e., Conventional with Industrial attachment and ODeL,

Pedagogical Instructional approaches: Could include real life applications of what is taught, 'hands on' teaching of basic computer simulations and modelling, group work and group discussions, using community members with expertise areas to share knowledge and skills and act as role models, applying indigenous knowledge systems, using university-industry collaborations, student internship or attachment at places of work, learning and teaching through research and presentations at seminars or workshops.

Content: HIL would have their traditional university main subject(s)' content areas in conjunction with application of ICT's and small business and entrepreneurship skills, basic accounting and management of business, basic machine engineering, making and selling artefacts such as baskets, pots, garments, etc.,

communication skills, heritage studies, music and literature basic manufacturing and value addition, marketing research, project planning, consultancy, monitoring and evaluation.

Assessment Strategies: Continuous, formative and summative assessments in forms of practical and theoretical exercises, assignments, tests and examinations should be used. Also, project work and portfolios could be assessed. Produced goods and services could be sold to generate income for the students and for their institutions.

CONCLUSION

This study has shown that research and innovation can impact positively on an individual in terms of promotion, motivation, knowledge creation and networking or collaboration. Research and innovation are also the backbone of development at institutional and country level but have to be supported at all levels in terms of manpower, transfer of knowledge and skills, resources and funding. Research and innovation can be measured through publications, patents, return on investment and GDP, among others. Economic growth could lead to reduction of poverty and foster further innovation and industrialisation. This could help to make developing countries such as Zimbabwe attain an upper middle economy by the year 2030 according to their vision. Policies that govern research and innovation should be put in place. Such policies could lead to an *innovative, entrepreneurial and industry-centred* curriculum for higher institutions of learning. The impact of research and innovation to the country's economy as cited by the interviewees was on food security to the population, production of personal protective equipment to fight the COVID-19 pandemic, provision of third-stream income to the authors, generation of revenue and saving foreign currency through import substitution measures. However, the exact extent of the impact of RI could not be established. Hence, Research Question 3 was not fully answered while the other research questions of this study were answered.

Limitations and Directions for Future Research

This study was limited to only four HEI in Gweru Urban district, and therefore generalization to all HEI in Zimbabwe may not be feasible. The study could not quantitatively or numerically measure the economic impact of research and innovation done by the HEI, although it can be viewed as an eyeopener in this direction. Future research could involve the whole country, and more and advanced economic impact measurements and instruments so as to come up with more reliable and comparable metrics.

RECOMMENDATIONS

1. Higher and tertiary institutions of learning should come with an innovative, entrepreneurial and industry-centred curriculum and put it into operation, so that research and economic growth may be boosted.
2. Higher and tertiary institutions of learning should come up with policies to guide and regulate staff and students on research and innovation.
3. HIL should fully support and fund research, innovation and industrialization since some of their employees and students may have brilliant ideas which may need funding for them to be successfully implemented.
4. Further studies on impact of research and innovation could also be carried out on a wider scale.

REFERENCES

1. Ashmore, R., Flanagan, T., McInnes, D. and Banks, D. (2016). The Delphi Method: methodological issues arising from a study examining factors influencing the publication or non-Publication of mental health nursing research. *Mental Health Review Journal*, 21 (2), 85-94.
2. Barrett, D. and Heale, R. (2020). What are Delphi studies? *Evid Based Nurs* 23 (3), 10.1136/ebnurs-2020-103303, pp. 68-69

3. Barrichello, A., dos Santos, E.G., and Morano, R.S. (2020). Determinant and priority factors of innovation for the development of nations, *Innovation & Management Review* 17(3), pp. 307-320
4. Cheah, S. (2016). Framework for Measuring Research and Innovation Impact, *Innovation*, 18(2), pp. 212-232 DOI: 10.1080/14479338216
5. Chen, K., Zhang, Y., & Fu, X. (2019). International research collaboration: An emerging domain of innovation studies. *Research Policy* 48, pp. 149–168.
6. Cheruto, K.L. & Chepchumba, K.R. (2017). Re-Designing Higher Education Curriculum for Sustainable Development, *US-China Education Review B*, 7(10), pp. 33-41, doi: 10.17265/2161-6248/2017.10.005
7. Chiome, C., Thondlana, S. & Mupa, P. (2013). *Theory and Practice of Project Evaluation in Education: Module MDEA505*. Zimbabwe Open University Press. Harare.
8. Chirume. S., & Thondhlana, S. (2018). Towards an Entrepreneurship Curriculum in a Developing Country Tertiary Institution: The Case of Zimbabwe Open University, *Socialsci Journal* 2, pp. 192-202.
9. Dzoma, G. (2024). Official And Unofficial Market Exchange Rates-October 2024, Retrieved on 22/10/24 from <https://zimpricecheck.com/price-updates/official-and-black-market-exchange-rates/>
10. ExLibris (2019). The New Challenges Facing Academic Researchers. <https://exlibrisgroup.com/blog/the-new-challenges-facing-academic-researchers>
11. Gelling, L. (1999). The Role of the Research Ethics Committee. *Nurse Education Today*, 19(7), pp. 564-9, Doi: 10.1054/nedt.1999.0349.
12. Government of Zimbabwe (2018). Towards an Upper-middle Income Economy by 2030. “New Dispensation Core Values,” Washington DC.
13. Horberry, R. (2021) Marketing: Three Big Research Challenges (and how to overcome them). <http://blog.gwi.cm/marketing/overcoming-research-challenges/>
14. Jones, T.V. & Rees, J. (eds.) (2018). Measuring impact of research and innovation for global challenges: A report on the outcomes of a joint UKRI USAID workshop on 25 and 26 October 2018 in Panama City, Panama, http://pdf.usaid.gov/pdf_docs/PA00TPCT.pdf
15. Joosten, M., Harness, L., and Cutalis, R. (2016). Top 5 Challenges in Conducting DETA Research, <https://uwm.edu/deta/top-5-challenges-in-conducting-deta-research/>
16. Kumwenda, S., Niang, E.H.A., Orlando, P.W., Bongo, G.N., and Chiwona, B. (2017). Challenges Facing Young Scientists in Their research Careers: A Qualitative Exploratory Study, *Malawi Medical Journal* 29(1), pp. 1-4.
17. Langford, C.H. (n.d). Measuring the Impact of University Research on Innovation. University of Calgary, [http://sites.utoronto.ca.isrn/publications/ Working Papers/ Working00/Langford00 Measuring.pdf](http://sites.utoronto.ca.isrn/publications/WorkingPapers/Working00/Langford00Measuring.pdf)
18. Macheka, T. (2019). Zimbabwe, Once the bread basket of Africa..., *Zimbabwe Food Security and Agriculture Cluster*. Retrieved on 22/10/24 from <https://fscluster.org/news/zimbabwe-once-bread-basket-africa>
19. Moxely, J.M. (n.d). Writing Commons: The encyclopedia for writers, researchers, and knowledge workers, <http://writingcommons.org/section/research/>
20. Mpeperek, S. (2019). Unpacking Education 5.0...turning knowledge into goods and services, *The Patriot*. Retrieved from https://www.thepatriot.co.zw/old_posts/unpacking-education-5-0-turning-knowledge-into-goods-and-services/
21. Mufuruki, A. A., Mawji, R., Kasiga, G. and Marwa, M. (2017). Tanzania’s Industrialisation Journey, 2016-2056, From an Agrarian to a Modern Industrialised State in Forty Years, Moran (E.A.) Publishers Limited, Nairobi, Kenya
22. Mwantimwa, K.M., Ndege, N.R., Atela, J.I., and Hall, A. (2021). Scaling Innovation Hubs: Impact on Knowledge, Innovation and Entrepreneurial Ecosystems in Tanzania, *Journal of Innovation Management*, 9(2), pp. 39-63 Doi <https://doi.org/10.24840/2183-0606-009.002-005>
23. Nyakwawa, M.G. (2017). From Beg Basket to Bread Basket, Mobile money can provide an alternative, *Development Finance Agenda*, CIDEF. Retrieved on 21/10/24 from [https://www.academia.edu/43299484/From Beg Basket to bread basket mobile money can offer an alternative in Zimbabwe](https://www.academia.edu/43299484/From_Beg_Basket_to_bread_basket_mobile_money_can_offer_an_alternative_in_Zimbabwe)
24. Ogbeifun, E., Agwa-Ejon, J., Mbohwa, C. and Pretorius, J. H. C. (2016). The Delphi technique: A credible research methodology. *Proceedings of the 2016 International Conference on Industrial Engineering and Operations Management*, Kuala Lumpur, Malaysia, March 8-10.

25. Olukaju, A. (2002). The crisis of research and academic publishing in Nigerian Universities: The twentieth century and beyond. 20th Annual Spring Symposium, 25-27 April 2002, Dakar, Senegal.
26. Polonetsky, C. (2014). 5 Barriers to Starting Great Research Projects. Elsevier Sci Tech Connect. <http://scitechconnect.elsevier.com/5-barriers-starting-great-research-projects/>
27. Popa, I.L., Preda, G., & Boldea, M. (n.d). A theoretical approach of the concept of Innovation, Managerial Challenges of the Contemporary Society 29, Faculty of Economics and Business Administration, Babes-Bolyai University, pp.151-156
28. Rajasekar, S. Philominathan, P. and Chinnathambi, V. (2013). Research Methodology, arXiv: physics/0601009v3 [physics. gen-ph], <https://doi.org/10.48550/arXiv.physics/0601009>
29. Research Council of Zimbabwe (2018). Commercialisation Handbook: An Introductory Guide for Researchers. Research Council of Zimbabwe, Harare
30. Secondary Data on Innovation Hubs Retrieved on 03/03/23 from <http://www.gwerupoly.ac.zw>, <http://www.mkobatc.ac.zw>, <http://www.msu.ac.zw> & <http://www.zou.ac.zw>
31. The World Bank in Zimbabwe (n.d). Retrieved on 19/10/24 from World Bank in Zimbabwe (<https://www.worldbank.org/en/country/zimbabwe/overview>)
32. The World Fact Book (n.d). Retrieved on 18/10/24 from <https://www.cia.gov/the-world-factbook/countries/zimbabwe/factsheets/>
33. UN General Assembly (2015). A/RES/70/1, Transforming our world: The 2030 Agenda for Sustainable Development, UN, Paris
34. UNESCO (2014). Mapping Research and Innovation in the Republic of Zimbabwe. In: G. A. Lemarchand and S. Schneegans, (eds.). GOàSPIN Country Profiles in Science, Technology and Innovation Policy, vol. 2. United Nations Educational, Scientific and Cultural Organization: Paris.
35. What is an innovation hub? <https://innovate.unc.edu/whats-an-innovation-hub-and-why-chapel-hills-will-surprise-you> what is an innovation hub? <https://www.innovationquarter.com/articles/what-is-an-innovation-hub>
36. Wolhuter, C.C. (ed.). (2018). Raising the Impact of Education Research in Africa, pp. i–412, AOSIS, Cape Town Zimbabwe Economic Outlook (n.d). Retrieved on 19/10/24 from <https://www.afdb.org/en/countries/southern-africa/zimbabwe/zimbabwe-economic-outlook>
37. Zulkifli, S., and Ismail, S. (2022). Innovation Hubs: Path to Stronger Economy Post Covid. <https://mranti.my/blog/innovation-hubs-path-to-stronger-economy-post-covid>