REVITALIZING ZIMBABWE'S TERTIARY EDUCATION SECTOR TO SUPPORT A ROBUST ECONOMIC RECOVERY

September 2020

MINISTRY OF HIGHER AND TERTIARY EDUCATION, SCIENCE & TECHNOLOGY DEVELOPMENT AND THE WORLD BANK

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FOREWORD

His Excellency, President ED Mnangagwa has set a vision for Zimbabwe to achieve an upper middle-income economy by 2030. The attainment of this vision requires our Ministry to enhance its role in human capital development through skills development, innovation, science and entrepreneurship promotion. The Ministry has embarked on a wholesale of reforms that are pivoted on the Education 5.0 Doctrine which seeks to refocus higher and tertiary education in Zimbabwe through the 5 pillars of Teaching, Research, Community Service, Innovation and Industrialization. The Doctrine also seeks to locate Higher and Tertiary education as the fulcrum upon which his excellency's vision of attaining an upper middle-income economy by 2030 will be rooted.

As we implement the Education 5.0 Doctrine, we are fully cognizant of the ever-changing world in which we operate hence the need for our higher & tertiary education sector to be up to speed with the constantly changing world. Zimbabwe's transformation and the development of the country's knowledge economy will largely depend on the country's workforce and their skills. Higher Education in Zimbabwe will thus seek to transform the country's economy through products that have the requisite 21st century skills that will allow them to adjust to the changing nature of work but most importantly to create employment through acquired entrepreneurship and innovation skills.

The National Critical Skills Audit of 2018 reflects huge gaps and demands in the areas of science, engineering and technology in the country. This has necessitated the need to strengthen the teaching of STEM courses in our higher and tertiary education institutions. Among other STEM strengthening strategies, the Ministry has also established Industrial & Technology Parks and Innovation hubs in select universities which are anticipated to promote the development and commercialization of innovative initiatives and emerging technology that is relevant to the socio-economic development of Zimbabwe while rooted in the country's heritage philosophy.

In contributing to His Excellency's Vision 2030, the Ministry is establishing strategic partnerships with business, industry, academic and international development actors in fostering Education 5.0 and position the higher and tertiary education sector as a key cog in the attainment of an upper middle-income economy. It is within this vein that the Ministry partnered with the World Bank Group to carry out this sector analysis. It is our hope that as we continue on our journey of reforming the higher & tertiary education sector in Zimbabwe, the findings and recommendations of this document will contribute to our ongoing efforts of producing innovative, techno-savvy , entrepreneurial and skilled graduates who will drive the country's socio-economic transformation as we move towards an upper middle income economy by 2030.

Prof. dr. A. Murwira
Minister of Higher and Tertiary Education, Science and Technology Development

PREFACE

The Ministry of Higher and Tertiary Education, Science & Technology Development, partnered with the World Bank to develop this Higher & Tertiary Education Sector Analysis which was developed through input from our institutions and through coordination of the Ministry. The Analysis sought to carry out a SWOT analysis of the sector with focus on identifying how the Ministry can significantly contribute to national development goals as spelt out in the Transitional stabilization plan (TSP) and specifically the President's 2030 vision.

The Sector Analysis identifies six key areas in which there are greater areas for opportunity as the country strengthens its education strategy in line with 5.0 Doctrine. These areas are: Defining a Long-Term Vision for the Sector; Expanding Access & Improving Equity; Improving Quality and Relevance; Building Research Capacity & Expanding Technology Transfer; and Developing a Sustainable Financing Strategy. I am glad to note that through the visionary leadership of the Hon. Minister Professor Murwira, the Ministry is already making significant steps in addressing some of the key aspects identified in this analysis hence its recommendations are largely in sync with ongoing reforms within our Ministry. Several initiatives that we are currently implementing within the Ministry such as the National Qualifications Framework, The Minimum Bodies of Knowledge, Innovation Hubs and realignment of several legislation among others all point out to the Ministry's commitment to enhancing Higher and Tertiary education in the country and making the education relevant to the 21st century.

We are fully convinced that this partnership with the World Bank will add significant value to our ongoing efforts through exposure to best practice from other parts of the world, and also the exposure of our own best practices to other countries and systems in which the World Bank operate.

Prof. F. Tagwira
Secretary for Higher and Tertiary Education, Science and Technology Development

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ACKNOWLEDGEMENTS

This report was jointly prepared by teams from the World Bank and the Zimbabwe Ministry of Higher & Tertiary Education, Science & Technology Development (MHTESTD). The Honorable Minister Prof. A. Murwira and the Permanent Secretary Prof. F. Tagwira provided guidance on the overall report in line with the MHTESTD's Education 5.0 Strategy. The World Bank team was led by Yoko Nagashima and composed of Jamil Salmi, Tapfuma Ronald Jongwe, Shiro Nakata, Katsuki Sakaue, and Michael Mambo under the overall guidance of Halil Dundar (Practice Manager), Mukami Kariuki (Country Manager, Zimbabwe) and Paul Noumba Um (Country Director for South Africa). The MHTESTD team was led by Mr. Charles Musari (Deputy Director Projects and Technology Transfer) and composed of Mr. Christopher Mudzingwa, Mrs. Ernie Nago, Mrs. Eukerious Marara and Ms. Beaula Chipoyera with overall guidance from Mrs. R. Karimanzira (Director Projects and Technology Transfer), Mrs. Martha Muguti (Director – Higher Education Programs) and Mrs. Dephine Zivanai (Director – Tertiary Education Programs). Both teams would like to express their gratitude to the universities, teacher colleges, polytechnic colleges, and industrial training centers that provided the institution-level data underpinning this analysis. The teams would also like to gratefully acknowledge the critical input received from the Zimbabwe University Vice Chancellors Association (ZUVCA), as represented by the Association's Chair, Prof. Eddie Mwenje. Additional input and data were also provided by the Zimbabwe Council for Higher Education (ZIMCHE), headed by its Chief Executive Officer, Prof. Kuzvinetsa P. Dzvimbo. The report benefited from valuable comments provided by World Bank colleagues, including Aleksandra Posarac (Program Leader); Roberta Malee Bassett (Sr. Education Specialist and Global Lead for Tertiary Education, Peer Reviewer), Jason Allen Weaver, (Senior Education Specialist, Peer Reviewer), and Francisco Marmolejo (Lead Education Specialist, Peer Reviewer). Elif Yukseker assisted the team throughout the process. The report was edited by Sean Lothrop and designed by Cybil Maradza.

ABBREVIATIONS

ARWU	Academic Ranking of World Universities
BOT	Build Operate and Transfer
ECD	Early Childhood Development
ESSP	Education Sector Strategy Plan
GDP	Gross Domestic Production
HCI	Human Capital Index
ICT	Information and Communication Technology
GER	Gross Enrolment Rate
MHTESTD	Ministry of Higher and Tertiary Education, Science and Technology Development
MOPSE	Ministry of Primary and Secondary Education
NER	Net Enrolment Rate
OECD	Organisation for Economic Cooperation and Development
PPP	Public Private Partnerships
SME	Small and Medium Enterprise
STEM	Science, Technology, Engineering and Mathematics
TIMMS	Trends in International Mathematics and Science Study
TSP	Transitional Stabilisation Programme
TVET	Technical Vocational Education and Training
UNESCO	United Nations Educational, Scientific and Cultural Organization
WEF	World Economic Forum
ZIMCHE	Zimbabwe Council for Higher Education
ZIMDEF	Zimbabwe Manpower Development Fund
ZIMREN	Zimbabwe Education and Research Network
ZIMSEC	Zimbabwe Schools Examinations Council
ZIMSTAT	Zimbabwe National Statistics Agency
ZUVCA	Zimbabwe University Vice Chancellors Association

Universities

BUSE	Bindura University of Science Education
CUT	Chinhoyi University of Technology
CUZ	Catholic University in Zimbabwe
GZU	Great Zimbabwe University
HIT	Harare Institute of Technology
LSU	Lupane State University
MSU	Midlands State University
NUST	National University of Science and Technology
UZ	University of Zimbabwe
WUA	Women's University in Africa
ZEGU	Zimbabwe Ezekiel Guti University
ZOU	Zimbabwe Open University

01 EXECUTIVE SUMMARY

1. This report assesses the performance of Zimbabwe's tertiary education system in the context of the country's development challenges. It provides a comprehensive diagnosis of sectoral issues as the basis for detailed policy recommendations to support the government's efforts to accelerate Zimbabwe's economic recovery and reduce socioeconomic disparities. The report evaluates the system's ability to utilize inputs efficiently and produce the outcomes targeted by policymakers. It also considers reform measures designed to improve the system's performance.

State of Zimbabwe's Tertiary Education Sector in the Wake of the Economic Crisis

2. Zimbabwe's unstable macro-fiscal environment has severely impeded its development. Formerly one of the most advanced economies in Sub-Saharan Africa, Zimbabwe is now among the most vulnerable. The economy's structural problems have negatively impacted employment and income dynamics. The urban unemployment rate continues to climb, and unemployment among urban youth has reached alarming levels. The latest available labor-force survey, which dates from 2014, indicates that the urban unemployment rate reached 30 percent, including both active and discouraged job seekers.

3. The new administration, which took office in July 2018, is striving to rebuild the Zimbabwean economy and achieve the goal of making Zimbabwe a "prosperous and empowered upper-middle-income society" by 2030. The Transitional Stabilization Plan (TSP) focuses on macroeconomic and financial-sector stabilization, private-sector-oriented policy and institutional reforms, and infrastructure investment. The TSP's five pillars include: (i) governance; (ii) macroeconomic stability and financial reengagement; (iii) inclusive growth; (iv) infrastructure and utilities; and (v) social development. The TSP represents the first stage of Vision 2030.

4. In spite of the political and macro-economic crisis of the last decade, Zimbabwe's human-capital indicators exceed the average for its region and income group. Zimbabwe's performance on the HCI's education dimension is strong by the standards of peer countries, but relatively weak in global terms. A Zimbabwean child who starts school at age four can expect to complete 10 total school years, but only 6.3 learning-adjusted school years, by age 18, indicating a learning gap of 3.7 years.

5. Zimbabwe's workforce is well educated by regional standards. As of 2014, a large majority of Zimbabweans between the ages of 15 and 64 had completed primary education, as well as some amount of secondary education, and roughly 10 percent had at least some tertiary education. However, gains in educational attainment over the last 20 years have been concentrated among the urban population, with little improvement observed among the rural workforce. Gender parity in educational attainment has steadily improved over the past decade, but a significant gender gap persists at the tertiary level (12% for men and 9% for women).

6. The Ministry of Higher and Tertiary Education, Science and Technology Development (MHTESTD) manages the postsecondary education subsector. The MHTESTD formulates and implements skills training and development policies and promotes science, technology and innovation. The ministry oversees, regulates, and registers all public and private universities, polytechnics, and teacher training colleges. Established in 2006, the Zimbabwe

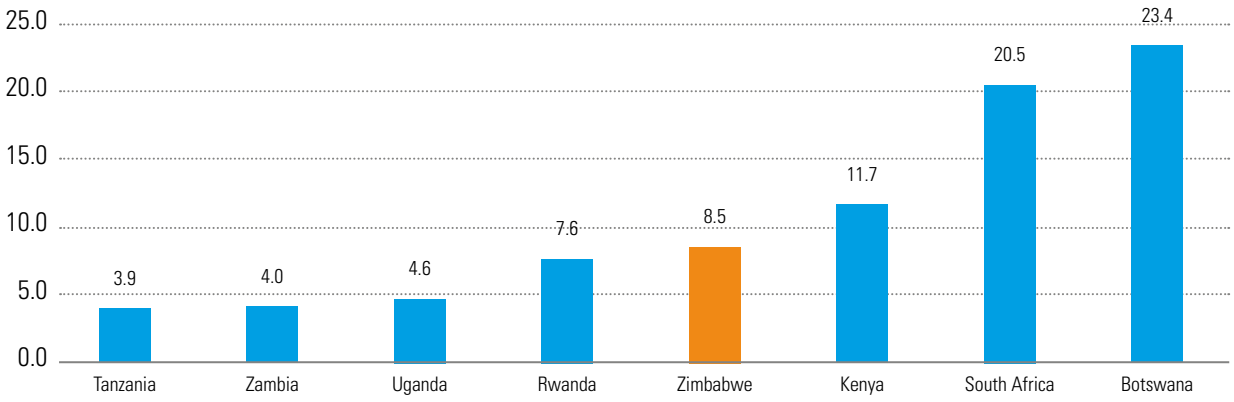
Council for Higher Education (ZIMCHE) ensures the quality of tertiary education by registering and accrediting institutions.

7. At first glance, Zimbabwe's human-capital endowment appears adequate relative to the demands of its economy, but a deeper analysis reveals critical gaps in workforce skills. A National Critical Skills Audit, conducted in 2018 to assess Zimbabwe's skills deficits and surpluses, confirmed the existence of large gaps between the supply and demand for skills in several key sectors, with a deficit in the production of qualified specialists and technicians especially in the natural and applied sciences, engineering and technology, the medical and health sciences, and agriculture.

The Performance of Zimbabwe's Tertiary Education Sector

8. At 8.5%, Zimbabwe's tertiary enrollment rate is yet to match the level of regional leaders, such as Botswana (23.4%), South Africa (20.5%), and Kenya (11.7%). Zimbabwe's tertiary Gross Enrollment Rate continued to increase between 2010 and 2015 (from 6 percent to 8.5 percent) despite deteriorating public investment in education, underscoring the strong demand for tertiary education among Zimbabwean households.

FIGURE 1 GROSS ENROLLMENT RATES IN TERTIARY EDUCATION, ZIMBABWE AND COMPARATORS, LATEST AVAILABLE YEAR (%)



Source: World Bank Data Bank – Education Statistics

9. A large majority of tertiary students are enrolled in public institutions. While Zimbabwe has six private universities, public universities accounted for about 90 percent of total university enrollment in 2017. Public TVET institutions and public teacher training colleges also dominate their subsectors, accounting for 98 and 64 percent of total enrollment, respectively.

10. Infrastructure constraints and tuition fees limit tertiary education access. Teaching space and affordable accommodations on and around tertiary institutions are very scarce. Tuition fees for public institutions are also a significant deterrent for students from poorer households, and the country lacks a viable and sustainable financial-support system for tertiary students.

11. High tuition fees contribute to significant dropout rates in both public and private universities. The questionnaire found that nearly 70 percent of dropouts cited tuition fees as the main reason for dropping out. By contrast, the survey found that repetition rates are generally low among both public and private universities, with the notable exception of the STEM-oriented public universities.

12. In the absence of a direct assessment of learning outcomes, university rankings are often used as a proxy measure of tertiary education quality, despite their methodological limitations. Neither the Shanghai Academic Ranking of World Universities or the Times Higher Education World University Ranking include any Zimbabwean university in their lists of the top 800 global institutions. Webometrics ranking is far more expansive and includes five Zimbabwean universities.[1] However, these institutions compare

poorly to other major universities in Sub-Saharan Africa, and only the University of Zimbabwe appears among the top 100 African universities in The Webometrics ranking.

TABLE 1 WEBOMETRICS UNIVERSITY RANKINGS, ZIMBABWEAN UNIVERSITIES AND COMPARATORS, 2019

Name of University	World Bank
University of Cape Town	272
University of Nairobi	993
Makerere University	1036
University of Ibadan	1148
University of Zimbabwe	**1977**
Midlands State University	**4699**
National University of Science & Technology	**5153**
Chinhoyi University of Technology	**5392**
Bindura University of Science Education	**5473**

Source: Webometrics (2018) http://www.webometrics.info/en

Note: Zimbabwean universities are in bold

TABLE 2 WEBOMETRICS TOP 100 UNIVERSITIES IN SUB-SAHARAN AFRICA, 2019

Country	Number of Universities in the Top 100	Rank of the Top University from Each Country
South Africa	18	1
Kenya	5	9
Uganda	2	11
Nigeria	10	15
Ghana	3	19
Ethiopia	2	21
Tanzania	3	26
Zimbabwe	**1**	**33**
Sudan	1	38
Mozambique	1	39

Source: Webometrics (2019) http://www.webometrics.info/en/Sub-Saharan

13. Several factors undermine the quality of the teaching and learning environment. Field visits to selected institutions and interviews with key university officials revealed that curricular and pedagogical practices remain largely traditional in many institutions.[2] An acute shortage of academic staff, especially in STEM programs in public universities, is negatively impacting education quality. Inadequate laboratories, workshops, and other specialized facilities significantly weaken education quality, especially in STEM programs.

14. In the absence of detailed labor market and technology transfer data, little information is available about the quality and relevance of existing STEM programs in Zimbabwe. However, the field

visits have shown that the main two bottlenecks in STEM universities and polytechnics are the lack of qualified academics and the acute difficulties faced in purchasing and maintaining state-of-the-art scientific equipment.

15. In spite of the economic crisis, Zimbabwe has managed to maintain a relatively high level of quantitative research output. Among Sub-Saharan African countries, Zimbabwean researchers published the third-highest number of research papers per capita, after South Africa and Kenya. However, the volume of Zimbabwe's research output belies the limited quality and impact of its scholarly publications. Zimbabwe's H-Index score is lower than those of most comparator countries. Zimbabwe also underperforms on measures of innovation and technology transfer compared to its peers. While a large share of Zimbabwean research involves international collaboration, the frequency of international research collaborations is lower in Zimbabwe than in other countries in the region, mostly because of the economic upheavals and the international sanctions imposed on Zimbabwe.

FIGURE 2 ZIMBABWE'S SHARE OF THE CITABLE PUBLICATIONS PRODUCED IN AFRICA, 2000-2017

Source: Scimago Journal and Country Rank

16. From a governance viewpoint, Zimbabwe's tertiary education sector suffers from several organizational and institutional weaknesses. First, the lack of clear articulation between "higher education" and "tertiary education", a distinction which is not common in other countries; inhibits the movement of students between the two subsystems. Second, the country lacks a comprehensive information-management system, which constrains performance monitoring and weakens the foundation for evidence-based policymaking. Third, the ZIMCHE's funding model relies on a tax imposed on each university based on their enrollment, creating a strong disincentive to report enrollment figures accurately.

17. At the institutional level, Zimbabwe's public universities are not fully autonomous, especially in terms of financial and human-resources management. The MHTESTD controls the budgetary and tuition policies of public universities. Even when faced with severe financial limitations, these universities are not allowed to strictly enforce their tuition requirements. Moreover, public universities are overseen by very large councils, with 30 to 45 members, who receive financial allowances paid by the universities. This system increases the cost and limits the quality and effectiveness of university governance.

18. From a resource mobilization viewpoint, Zimbabwe's economic crisis over the past decade has deprived the tertiary education sector of much-needed funding. In addition, the MHTESTD budget has fluctuated substantially from year to year.

19. In terms of resource allocation, history-based budgeting drives the allocation of funding to Zimbabwe's tertiary education sector. As a result, current spending per student varies considerably between public universities because budget allocations are not based on an objective and transparent funding formula that would reflect enrollment numbers, actual cost of programs and their scientific infrastructure, staff headcounts, or institutional performance.

The Way Forward: Policy Options to Revitalize Zimbabwe's Tertiary Education Sector

20. After many years of crisis, a comprehensive approach is needed to revitalize Zimbabwe's tertiary education system. The Government could consider a range of policy options in the following areas: (i) Defining a vision for the future; (ii) Expanding Access and Increasing Equity; (iii) Improving the quality and relevance of tertiary education programs; (iv) Building research capacity and accelerating technology transfer; (v) Putting in place appropriate institutional governance and management arrangements; and (vi) Developing a sustainable financing strategy.

Elaboration of a National Vision

21. Zimbabwe's tertiary sector has suffered from a lack of strategic planning, which was exacerbated by the country's economic crisis. The most urgent priority for revitalizing the sector, therefore, is to elaborate a bold vision for its development. This strategy should set targets for the overall size of the tertiary sector and its institutional configuration in line with the government's overarching goal of producing highly qualified graduates and valuable research to support Zimbabwe's economic recovery. In this context, the Education 5.0 document prepared by the MHTESTD establishes a sound framework for elaborating a comprehensive vision for the tertiary education sector. Once articulated, Zimbabwe's strategic vision must be operationalized through a comprehensive master plan.

Expansion and Equity Strategy

22. Considering Zimbabwe's low level of tertiary enrollment, the dominant position of public universities in the tertiary sector, and the government's limited resources, policymakers may wish to consider an expansion strategy based on institutional differentiation. Institutional differentiation leverages the complementary advantages of various institution types and education modalities to create a flexible and adaptive labor force. Transforming some of the TVET institutions into Community colleges designed after the North American or South Korean model can help absorb a large share of the student population at a reduced cost compared to universities. Distance education through the Zimbabwe Open University can provide an important complement to traditional tertiary institutions. Finally, many countries have encouraged the growth of private universities to help meet a growing demand for tertiary education while further diversifying its institutional composition and easing pressure on the government's education budget.

23. Equity-promotion policies could complement institutional differentiation by reducing disparities in access to and success in tertiary education. The most effective equity-promotion policies address both the financial and non-financial elements of tertiary education access. On the one hand, well-targeted and efficiently managed financial aid through well-targeted bursaries and student loans can be instrumental in reducing financial barriers to tertiary education. On the other hand, non-monetary measures, such as outreach and bridging programs, reformed selection procedures and/or preferential admissions, special institutions and programs targeting underprivileged groups, and targeted retention programs, could further enhance the equity of tertiary education.

Improving Quality and Relevance

24. Improving the quality and relevance of tertiary education in Zimbabwe will require a combination of interventions. These interventions should target four key determinants of education quality and relevance: (i) the preparation of incoming students; (ii) the qualifications of academics; (iii) curricular and pedagogical practices; and (iv) links to the productive sectors.

25. Improvements in secondary education can better prepare incoming tertiary students. Expanding math and science education, promoting STEM-based career paths, and offering targeted STEM mentoring activities and scholarships to girls could boost the readiness of new tertiary students to succeed in STEM programs.

26. Improving the qualifications of academics will be critical to enhance tertiary education quality in Zimbabwe. To meet the growing demand for qualified academics and the shortfall in PhD holders, universities can strive to: (i) attract qualified Zimbabwean academics from the diaspora, (ii) expand their master's and doctoral programs and hire their own graduates as teaching staff; (iii) expand international training opportunities for

Zimbabwean academics; and (iv) allow academic staff to work on a contract basis at other universities in addition to their primary employer. Increasing the share of qualified female academics could greatly enhance the quality of teaching, learning, and research in Zimbabwean universities.

27. Curricular and pedagogical reforms should focus on modernizing program content and enhancing delivery. To create incentives for tertiary education institutions to transform their approach to teaching and learning, the Zimbabwean authorities should encourage universities to move away from traditional pedagogical methods and embrace a more interactive, collaborative, and experiential approach.

28. Adopting innovative pedagogical techniques can enhance the quality and relevance of teaching and learning. Technological developments in online education, self-guided instruction, peer-to-peer learning, team-based learning, the "flipped classroom" model, and digital simulations utilize computers, artificial intelligence, and machine learning can support these innovative pedagogical practices. Establishing well-resourced teaching and learning centers in all tertiary education institutions could support the adoption of new pedagogical methods.

29. Strengthening linkages with industry can improve the employment prospects of tertiary graduates. Universities can obtain internships for undergraduate students and in-company placements for research students and academics, and they can encourage private-sector professionals to offer their services as visiting lecturers. Incorporating entrepreneurship training into regular university programs can help increase their relevance to the private sector, and universities can establish cooperative learning programs that alternate on-campus learning periods with regular in-firm internships.

30. Finally, it is fundamental to strengthen the existing quality assurance functions carried out by ZIMCHE. The registration, accreditation and institutional audits for which ZIMCHE is responsible must be undertaken with the appropriate level of professional independence and technical capacity to enforce high quality standards throughout the tertiary education system. In addition to strengthening the official quality assurance mechanisms at the national level, the Zimbabwean Government should also consider offering incentives for the establishment and/or consolidation of internal quality assurance units in all tertiary education institutions, which are essential for the development of a genuine and effective quality assurance culture.

Building Research Capacity and Output

31. To build the research capacity of Zimbabwe's top universities, the government must: (i) articulate a clear science and technology strategy, and (ii) increase public funding for research. Building Zimbabwe's research capacity will be critical to accelerate the country's economic recovery and achieve its development objectives. Incentives that encourage the return of Zimbabwean researchers working abroad and foreign exchange programs for PhD students will be instrumental to this effort. As they devise a strategy for building the country's research capacity, the authorities should take steps to maximize the value of their limited resource envelope. One of the most important goals of the national science and technology strategy should be to determine the optimal number of research-oriented universities to which the government can commit adequate long-term funding. The authorities should also seek to focus the country's existing research capacity on national priorities.

32. An institution's ability to attract and retain a mix of young, promising researchers and older, more experienced researchers is critical to its overall research capacity. While several Zimbabwean universities have strong research teams, institutions with the potential to become more research-intensive must develop capacity-building programs and provide adequate incentives to encourage and reward high-impact research. Zimbabwean universities can also enhance the quality and quantity of their research output by collaborating with the private sector and participating in international research networks.

Modernizing Governance

33. Modernizing the administration of the tertiary education sector will require reforms under three strategic axes: (i) reforming the sector's administrative framework; (ii) increasing the autonomy of tertiary institutions; and (iii) ensuring that those institutions are fully accountable for their academic performance and use of public resources.

34. The government could begin its administrative reform efforts by eliminating the distinction between "higher education" and "tertiary education" and

integrating the various tertiary sub-sectors into a well-articulated system. The MHTESTD should be solely responsible for coordinating the work of all the government agencies involved in administering tertiary education institutions in Zimbabwe. Consolidating the MHTESTD's leadership role would help ensure that all policy and funding decisions are fully coordinated and designed to support the complementary development of all tertiary education subsectors. An indispensable platform to facilitate the work of the MHTESTD will be to put in place a comprehensive Management Information System on the most important dimensions of performance and operation of the higher and tertiary education system.

35. Reforms at the institutional level should strive to increase the autonomy of Zimbabwean universities. This will require empowering smaller university councils with majority representation from outside the universities. Furthermore, the Zimbabwe's tertiary education institutions require the ability to exercise meaningful control over the factors that determine the quality and costs of their programs. Institutional autonomy encompasses the authority to establish admissions requirements, determine the size of the student body, manage human resources, and establish new programs and courses.

36. Increased institutional autonomy should be accompanied by a well-defined accountability framework. International good practices for institutional accountability require at least two types of annual report: (i) a financial audit report prepared according to international accounting standards; and (ii) an annual performance report showing progress against each of the university's own strategic objectives and yearly plan.

Sustainable Financing Strategy

37. A sustainable financing strategy for the Zimbabwean tertiary education system should include specific plans to increase resource mobilization and enhance resource allocation in ways that reward performance. Given the government's tight fiscal constraints, it is unlikely that the authorities will be able to significantly increase public spending on tertiary education. Consequently, the government will need to explore other financing options to achieve its goals for expanded enrollment and enhanced education quality in both the university and non-university subsectors.

38. Establishing PPPs could enable the authorities to mobilize additional resources from the private sector. The Zimbabwean government has already begun to explore the possibility of using PPPs to complement public investment in tertiary education. PPPs have proven to be an especially effective mechanism for building university infrastructure, such as dormitories, cafeterias, and solar energy power plants.

39. Improving the efficiency of publicly funded education programs and institutions is another way of maximizing the impact of a limited budgetary envelope. While data limitations prevent a thorough analysis of the internal efficiency of public universities and TVET institutions, creating effective retention programs that reduce the country's high dropout rates would likely generate substantial fiscal savings.

40. Boosting own-source revenue mobilization among tertiary education institutions could effectively complement the government's limited resources. While tuition fees in Zimbabwe are already high by the standards of comparable countries, Zimbabwean universities have considerable scope to raise resources through donations, contract research, consultancies, continuing education, and similar income-generation activities. Many institutions began experimenting with alternative revenue strategies during the economic crisis, and further efforts in this area could both expand and diversify their revenue base.

41. Based on the lessons from international experience, an adequate model for allocating public funds for tertiary education in Zimbabwe would be well served to apply the following eight principles: (i) closely aligning education funding levels with national priorities; (ii) explicitly linking funding to performance; (iii) improving equity across income levels and demographic groups; (iv) ensuring transparency in the allocation criteria; (v) achieving consistency and compatibility among the various financing instruments; (vi) maintaining stable funding levels over time; (vii) promoting institutional autonomy and accountability; and (viii) allocating funding primarily through block grants.

42. To promote the efficient use of public resources, the government could introduce performance-based budget mechanisms designed to align the financial incentives of institutions with national policy goals. The government could leverage three mechanisms,

either separately or together, to improve public expenditure efficiency in the tertiary education sector: (i) funding formulas; (ii) performance-based grants; and (iii) competitive grants.

43. Allocating resources to educational institutions according to a transparent formula that reflects performance indicators can sharpen efficiency incentives. The funding formula can be weighted according to the relative priority of various educational outputs and outcomes, such as the number of graduates, the employment rate of graduates, or the number of published research papers.

44. Performance-based contracts are nonbinding regulatory agreements negotiated between governments and tertiary education institutions that define a set of mutual obligations. In return for the participating universities' commitment to meeting the performance targets established in the agreement, the government provides them with additional funding.

45. Competitive funds have proven to be an effective and flexible means of financing transformative investment in tertiary education. Under this mechanism, institutions are invited to formulate project proposals that are reviewed and selected by committees of peers according to transparent procedures and criteria.

Conclusion

46. To revitalize tertiary education and maximize its contribution to Zimbabwe's economic recovery, the government will need to implement extensive reforms to the sector's policy, administrative, and institutional frameworks. Though Zimbabwe faces considerable challenges, its emergence from the recent crisis presents a unique opportunity to craft a bold new strategic agenda for the tertiary education sector and to implement critical policy changes that might otherwise be thwarted by vested interests. The MHTESTD should seize this opportunity to translate the Education 5.0 vision into a concrete set of reforms, programs, and projects backed by a sustainable financing strategy and appropriate implementation arrangements.

47. Zimbabwe's extensive developmental needs and difficult economic circumstances underscore the importance of coordination among its external development partners. Several of Zimbabwe's external partners are willing to support the revitalization of the tertiary education sector, and some have already begun providing financial and technical assistance. Coordination will be vital to ensure that external support reflects the government's priorities and that the various donor-supported programs and projects are mutually consistent and complementary.

48. Reforming Zimbabwe's tertiary education sector is a challenging endeavor, and a clear action plan will be crucial to achieve the government's policy objectives. International experience shows that success is most likely when policymakers thoroughly assess the prevailing social and political circumstances, build a consensus among key stakeholders, properly sequence the implementation of the reform agenda, and mobilize additional resources to bolster support and mollify opposition. Meeting these conditions requires a detailed strategy and action plan, which must reflect the government's self-defined priorities for the future of the tertiary education sector.

Matrix of Policy Options

49. Tertiary education reform is a complex process that requires a carefully sequenced and prioritized agenda. Table A and B summarize the policy options presented throughout this section. The first one categorizes each option as either short term, medium term, or long term based on their urgency and implementation duration. The second one assesses the relative difficulty involved in implementing each policy option given its technical complexity, financial cost, and political sensitivity.

TABLE 3 SEQUENCING OF POLICY OPTIONS

Policy Measures	Short-Term	Medium-Term	Long-Term
A. Vision Setting			
Formulation of detailed vison and strategic plan	✔		
Implementation of strategic plan		✔	✔
Mobilization of resources needed to implement plan	✔	✔	
B. Expansion through Institutional Diversification			
Analysis of TVET colleges	✔		
Development of strategy for upgrading TVET colleges	✔		
Upgrading of TVET colleges		✔	
Assessment of Zimbabwe Open University (ZOU) performance and challenges	✔		
Formulation of strategic plan to expand ZOU	✔		
Implementation of ZOU strategic plan		✔	
Identification of barriers to development of private tertiary education sector	✔		
Simplification of regulatory requirements	✔		
Financial incentives for accredited private institutions			✔
C. Improving Education Quality and Relevance			
Secondary Education			
Improvements in quality of secondary education			✔
Secondary & Tertiary Education			
Training of academic counselors	✔		
Development of academic counselling in secondary schools and tertiary institutions		✔	✔
Creation of secondary/tertiary outreach and bridge programs		✔	✔
Tertiary Education			
Design of system to identify at-risk tertiary students	✔		
Design of foundation program	✔		
Operation of foundation program		✔	
Operation of retention programs encompassing academic, psychological and financial support		✔	✔
Elaboration of training plan for academics	✔		
Implementation of training plan for academics		✔	✔
Establishment of teaching and learning services unit	✔		
Implementation of curricular and pedagogical innovations		✔	
Improving Relevance			
Participation of industry professionals in institutional curriculum committees	✔	✔	✔
Expansion of student internships	✔	✔	
Expansion of private-sector consultancy and research contracts	✔	✔	

Policy Measures	Short-Term	Medium-Term	Long-Term
Consolidating Quality-Assurance Mechanisms			
Alignment of quality-assurance mechanisms with international best practices	✔	✔	
Establishment or consolidation of institutions' internal quality-assurance units	✔	✔	
D. Enhancing Research Capabilities			
Development of national science and technology policy	✔	✔	
Review of research funding organizations and methodology	✔		
Increased research funding under new methodology		✔	✔
Provision of incentives for female researchers	✔	✔	
Provision of incentives for promising young researchers at research-intensive universities	✔	✔	
Creation of specialized research teams at research-intensive universities		✔	✔
E. Improving Governance			
Design of unified tertiary education system	✔	✔	
Designation of MHTESTD as lead agency in the tertiary sector	✔	✔	
Design of information-management system for tertiary education by MHTESTD	✔	✔	
Implementation of information-management system for tertiary education by MHTESTD		✔	
Assessment of institutional autonomy	✔		
Implementation of reforms increasing autonomy and accountability among tertiary education institutions		✔	
F. Financial Sustainability			
Definition of terms of public-private partnerships by MHTESTD	✔		
Resource mobilization through public-private partnerships		✔	✔
Definition of targeted free tuition policy by MHTESTD and the Treasury	✔		
Implementation of targeted free tuition policy		✔	
Design of student loan scheme	✔	✔	
Implementation of student loan scheme		✔	✔
Design of performance-based financial allocation mechanism by MHTESTD	✔ ✔		
Implementation of performance-based allocation mechanism		✔	
Income diversification by tertiary education institutions	✔	✔	

TABLE 4 IMPLEMENTATION DIFFICULTY OF POLICY OPTIONS

Policy Measure	Technical Complexity	Financial Cost	Political Sensitivity
A. Vision Setting			
Formulation of detailed vison and strategic plan	++	-	++
Implementation of strategic plan	+++	+++	+
Mobilization of resources needed to implement plan	++	+++	++
B. Expansion through Institutional Diversification			
Analysis of TVET colleges	++	+	-
Development of strategy for upgrading TVET colleges	++	+	-
Upgrading of TVET colleges	++	++	-
Assessment of Zimbabwe Open University (ZOU) performance and challenges	+	+	-
Formulation of strategic plan to expand ZOU	++	+	-
Implementation of ZOU strategic plan	++	+	+
Identification of barriers to development of private tertiary education sector	++	+	-
Simplification of regulatory requirements	+	-	+
Financial incentives for accredited private institutions	+	+	+
C. Improving Education Quality and Relevance			
Improvements in quality of secondary education	++	++	-
Training of academic counselors	+	+	-
Development of academic counselling in secondary schools and tertiary institutions	+	+	-
Creation of secondary/tertiary outreach and bridge programs	+	-	-
Design of system to identify at-risk tertiary students	++	+	+
Design of foundation program	++	+	-
Operation of foundation program	+	+	-
Operation of retention programs encompassing academic, psychological and financial support	++	+	+ -
Elaboration of training plan for academics	+	+	-
Implementation of training plan for academics	+	+++	+
Establishment of teaching and learning services unit	++	+	++
Implementation of curricular and pedagogical innovations	++	+	-
Participation of industry professionals in institutional curriculum committees	+	-	
Expansion of student internships	+	+	-
Expansion of private-sector consultancy and research contracts	+	-	-

Policy Measure	Technical Complexity	Financial Cost	Political Sensitivity
D. Enhancing Research Capabilities			
Development of national science and technology policy	++	-	+
Review of research funding organizations and methodology	+	-	++
Increased research funding under new methodology	+	+++	-
Provision of incentives for female researchers	+	++	-
Provision of incentives for promising young researchers at research-intensive universities	+	+	+
Creation of specialized research teams at research-intensive universities	++	++	+
E. Improving Governance			
Design of unified tertiary education system	++	-	++
Designation of MHTESTD as lead agency in the tertiary sector	+	-	+
Design of information-management system for tertiary education by MHTESTD	+	+	-
Implementation of information-management system for tertiary education by MHTESTD	+	+	+
Assessment of institutional autonomy	+	-	+
Implementation of reforms increasing autonomy and accountability among tertiary education institutions	++	-	++
F. Financial Sustainability			
Definition of terms of public-private partnerships by MHTESTD	++	-	-
Resource mobilization through public-private partnerships	+	+	+
Definition of targeted free tuition policy by MHTESTD and the Treasury	++	-	+
Implementation of targeted free tuition policy	++	+++	+
Design of student loan scheme	+++	-	-
Implementation of student loan scheme	++	++	+
Design of performance-based financial allocation mechanism by MHTESTD	++	-	+
Implementation of performance-based allocation mechanism	++	+	++
Income diversification by tertiary education institutions	+	-	-

Note: (-)neutral; (+) low; (++) medium; (+++) high

02 INTRODUCTION

Background

1. Tertiary education is a key driver of economic growth and poverty reduction. Tertiary education systems play a critical role in: (i) training a qualified and adaptable labor force that includes scientists, professionals, technical specialists, teachers, and highly qualified leaders in the public and private sectors; (ii) generating new knowledge through basic and applied research; and (iii) accessing existing international technologies and adapting them for local use. Tertiary education is vital to a sustainable structural economic transformation and long-run productivity growth, especially in countries with weak institutional capacity and limited human capital.

2. Globally, the tertiary education ecosystem has evolved in the past decade at an increasingly rapid pace, influenced by elements of uncertainty, complexity and disruption, such as changing demographics, global competition, political volatility, diminished public funding, greater private involvement, growing accountability demands, alternative delivery modes, and game-changing technologies. These trends represent both challenges and opportunities for tertiary education systems in developing countries, which face an exponentially rising demand as more young people graduate from high school as a result of countries' success in implementing the Education for All agenda.

3. The 2018 World Development Report highlighted the transformative impact of digitalization and automation on global labor markets.[3] The report found that the boundaries of the traditional firm are becoming blurred, as the rapid growth of platform marketplaces connects customers, producers, and service providers in new ways. Meanwhile, technology is reshaping the demand for skills, a process driven by the rise of digital firms that require trained ICT specialists and technicians. The increasingly technology-intensive nature of work is altering the mix skills demanded by the private sector, even among traditional firms. While the demand for basic cognitive skills is declining, "the demand for advanced cognitive skills, socio-behavioral skills, and skill combinations associated with greater adaptability is rising."[4] Countries that are experiencing rapid technological advancement also tend to enjoy robust economic activity and job creation, and human-capital formation is increasingly critical to economic growth:

> Investing in human capital is the priority to make the most of this evolving economic opportunity. Three types of skills are increasingly important in labor markets: advanced cognitive skills such as complex problem-solving, socio-behavioral skills such as teamwork, and skill combinations that are predictive of adaptability such as reasoning and self-efficacy. Building these skills requires strong human capital foundations and lifelong learning.[5]

4. A recent World Economic Forum (WEF) assessment found that many employers in Sub-Saharan Africa cite an inadequately skilled labor force as a major constraint on doing business.[6] The growing share of ICT-intensive jobs in the region appears to be outstripping the supply of workers with the requisite skills. The WEF predicts that over the medium term, automation will affect 52 percent, 44 percent, and 46 percent of all work activities in Kenya, South Africa and Nigeria, respectively.

5. Another WEF analysis, conducted in partnership with LinkedIn, found that the most in-demand employment

categories in Africa include creative professionals, food technologists, 3D designers, datacenter workers, and education and healthcare workers. The report estimated that, in the long term, the sectors with the strongest growth potential are hard and soft infrastructure, the green economy, and ICT:

> The greatest long-term benefits of ICT intensive jobs in the region are likely to be not in the lower-skilled delivery of digital products or services but in digital design, creation and engineering. To build a pipeline of future skills, Africa's educators should design future-ready curricula that encourage critical thinking, creativity and emotional intelligence as well as accelerate acquisition of digital and STEM skills to match the way people will work and collaborate in the Fourth Industrial Revolution.[7]

The Analytical Objectives, Methodology and Scope of This Report

6. The following analysis is designed to assesses the performance of Zimbabwe's tertiary education system in the context of the country's development challenges. A comprehensive diagnosis of sectoral issues provides the basis for detailed policy recommendations to support the government's efforts to accelerate Zimbabwe's economic recovery and reduce socioeconomic disparities. The analysis evaluates the system's ability to utilize inputs efficiently and produce the outcomes targeted by policymakers. It also considers reform measures designed to improve the system's performance.[8]

7. The preparation of this report was informed by consultations with key stakeholders, surveys of tertiary education institutions, and field research conducted at a sample of public and private tertiary education institutions in Zimbabwe. The analysis also draws on a literature review, which included: (i) official publications and policy documents of the Zimbabwean government and strategic documents prepared by the tertiary education institutions; (ii) regional reports and studies by the OECD, the World Bank, the African Development Bank, and other international institutions; (iii) recent academic work on tertiary education reform in OECD countries and Sub-Saharan Africa; (iv) national, regional and international statistics on various dimensions of tertiary education performance; and (v) government budget reports and household survey data.

8. As a result of the political and economic crisis that affected Zimbabwe in the past decade, detailed information about the performance and operation of the tertiary education system is incomplete and not up-to-date. To compensate for this limitation, the World Bank team conducted a survey of tertiary education institutions with the active support of the Ministry of Higher and Tertiary Education, Science and Technology for Development. Annex 2 provides the list of tertiary education institutions that participated in this survey. The team also relied on available international statistics (OECD, UNESCO, World Bank) for benchmarking the performance of Zimbabwean universities.

9. The first section discusses the performance of Zimbabwe's tertiary education sector in terms of its efficiency and alignment with the government's policy objectives. Section II presents an analysis of the main determinants if the system's performance and evaluates a range of potential reform options. Section III offers recommendations designed to enhance the tertiary education system's contribution to the government's development objectives.


Metric Conversion
Tables
DANGER 380 VOLTS
CAUTION

03 THE STATE OF ZIMBABWE'S TERTIARY EDUCATION SECTOR IN THE WAKE OF THE ECONOMIC CRISIS

Country Context

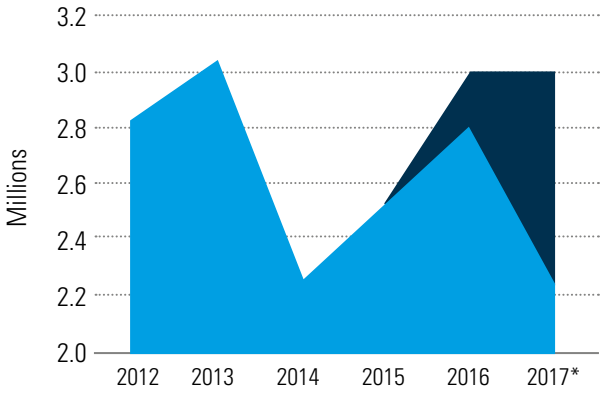
10. Zimbabwe is a resource-rich, landlocked country with a population of 14.8 million, 60 percent of whom are under the age of 24. Over the last four decades, political changes and economic hardship have altered the country's demographic profile, and roughly half of all Zimbabwean professionals with a university degree have left the country to seek opportunities elsewhere. Estimates put the size of the diaspora somewhere between two to five million, with remittances exceeding US$1.8 billion in 2014.

11. Agriculture is the traditional mainstay of the Zimbabwean economy, and the country's potential for structural economic transformation remains largely unrealized. Almost 70 percent of Zimbabweans live in rural areas, where subsistence farming is the main source of livelihoods. Zimbabwe is also richly endowed with over 40 exploitable mineral deposits, including reserves of gold, platinum, diamonds, copper, chrome, nickel, palladium, cobalt, tin, iron ore, limestone, coal, and diamonds.

12. Zimbabwe's unstable macro-fiscal environment has severely impeded its development. Formerly one of the most advanced economies in Sub-Saharan Africa, Zimbabwe is now among the most vulnerable. Its nominally dollarized economy is under pressure from diminishing net capital inflows, and an expansionary fiscal stance has generated an acute cash shortage, prompting the government to impose controls on capital- and current-account transactions. Government debt to the banking sector has spiked since 2015, contributing to a protracted financial crisis that has restricted credit to the economy, dampening private-sector activity. A drought in 2015-16 reduced agricultural output, diminished hydroelectricity generation, and exacerbated rural poverty.7 Despite robust growth in the mining sector and a more modest expansion in manufacturing and services, the GDP growth rate fell from 2.1 percent in 2014 to 0.6 percent in 2016.

13. Zimbabwe's structural problems have negatively impacted employment and income dynamics. The share of the labor force employed in the informal sector rose from 27 percent 1991 to a staggering 94 percent in 2014, and an economic structure dominated by large firms has given way to a profusion of small and medium enterprises (SMEs), which are estimated to number over 3.2 million. Low productivity and underemployment characterize livelihoods in the informal sector, and weak employment and wage growth hinder poverty reduction. The number of people living in extreme poverty has declined since 2012 (Figure 1), but since 2014 the overall poverty rate has risen, while per capita GDP has declined (Figure 2).

FIGURE 3 THE NUMBER OF PEOPLE LIVING IN EXTREME POVERTY, 2012-16 (MILLIONS)

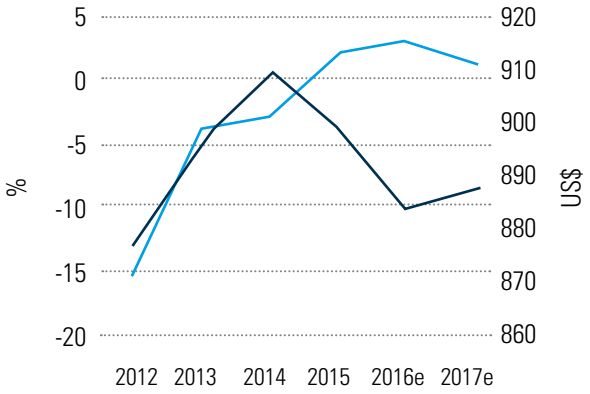


- Number of additional people living in extreme poverty as predicted in October 2016
- Number of people living in extreme poverty (updated estimate)

Source: World Bank

Note: 2016e and 2017e are World Bank staff estimates

FIGURE 4 THE POVERTY RATE AND GDP PER CAPITA, 2012-17 (% AND US$)



- Poverty rate changes over time (LHS)
- GDP per capita (RHS)

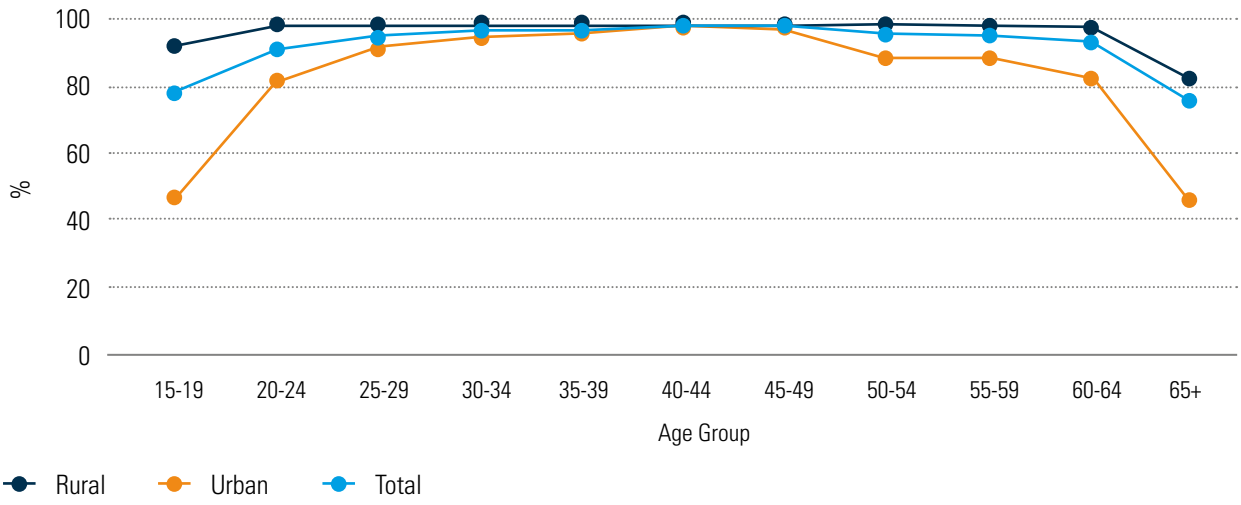
Source: World Bank

Note: 2016e and 2017e are World Bank staff estimates

Labor Markets and Employment Dynamics in Zimbabwe

14. Labor-force participation rates are high across all demographic groups. The labor-force participation rate is 91 percent among Zimbabweans ages 15 and above, and it peaks at over 95 percent among people of prime working age (Figure 3). Gender differences in labor-force participation are very modest: 92 percent of male adults and 89 percent of female adults are active in the labor force. A slightly larger disparity appears between the rural labor-force participation rate (95 percent) and the urban rate (83 percent). Among Zimbabweans who are not active in the labor force, 48 percent are students, which contributes to the lower participation rate in urban areas. Labor-force participation rates have increased over time, rising from 73 percent in 1997 to 83 percent in 2004 and reaching 91 percent in 2014. Zimbabwe's labor-force participation rates are high both by historical standards and in comparison to neighboring countries, reflecting the population's efforts to cope with a highly challenging economic environment.

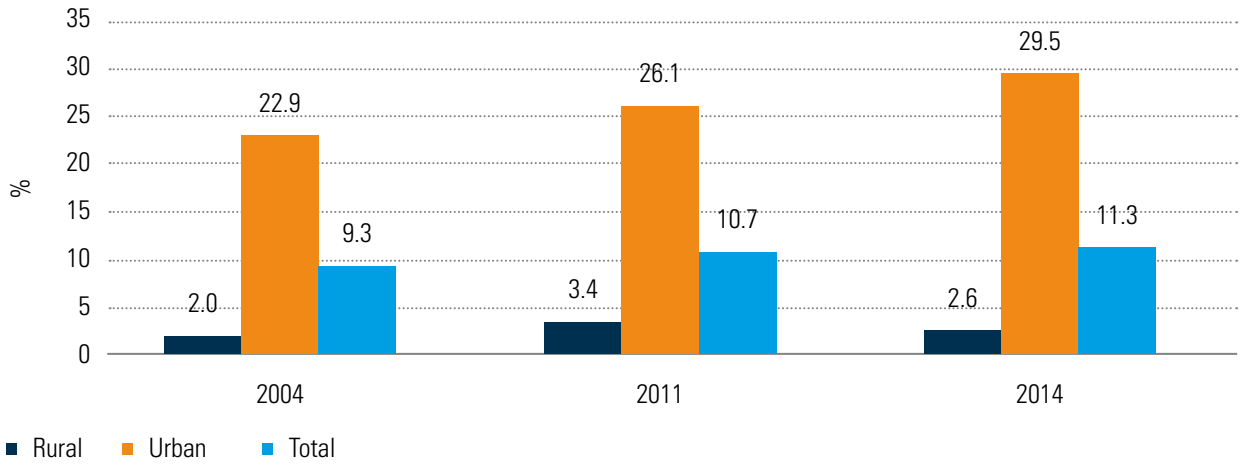
FIGURE 5 LABOR-FORCE PARTICIPATION RATES BY AGE GROUP, 2014



Source: Labour Force Survey, 2014

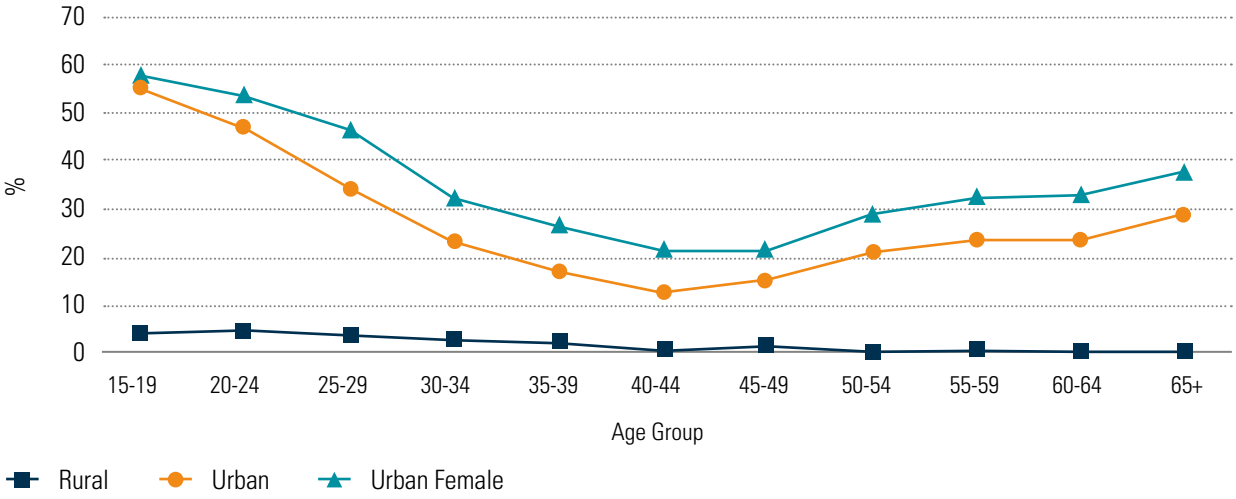
15. The urban unemployment rate continues to climb, and unemployment among urban youth has reached alarming levels. The latest available labor-force survey, which dates from 2014, indicates that the urban unemployment rate reached 30 percent, including both active and discouraged job seekers. Urban areas are home to around one-third of Zimbabwe's working-age population and labor force, and in an adverse macroeconomic environment marked by limited industrial investment, the urban employment rate has steadily worsened over the past decade (Figure 4). Urban unemployment is especially high among young and female workers: about half of all workers between the ages of 20 and 24 are unemployed, with deeply negative implications for social stability, household income levels, and human-capital development. Young female workers in urban areas face an especially challenging job market. Unemployment rates for women are consistent higher than those for men at every age group (Figure 5), and half of urban women their 20s are unemployed.

FIGURE 6 UNEMPLOYMENT RATES IN RURAL AND URBAN AREAS, 2004, 2011, AND 2014



Source: Labour Force Surveys, 2004, 2011, and 2014

FIGURE 7 UNEMPLOYMENT RATES BY AGE GROUP, 2014

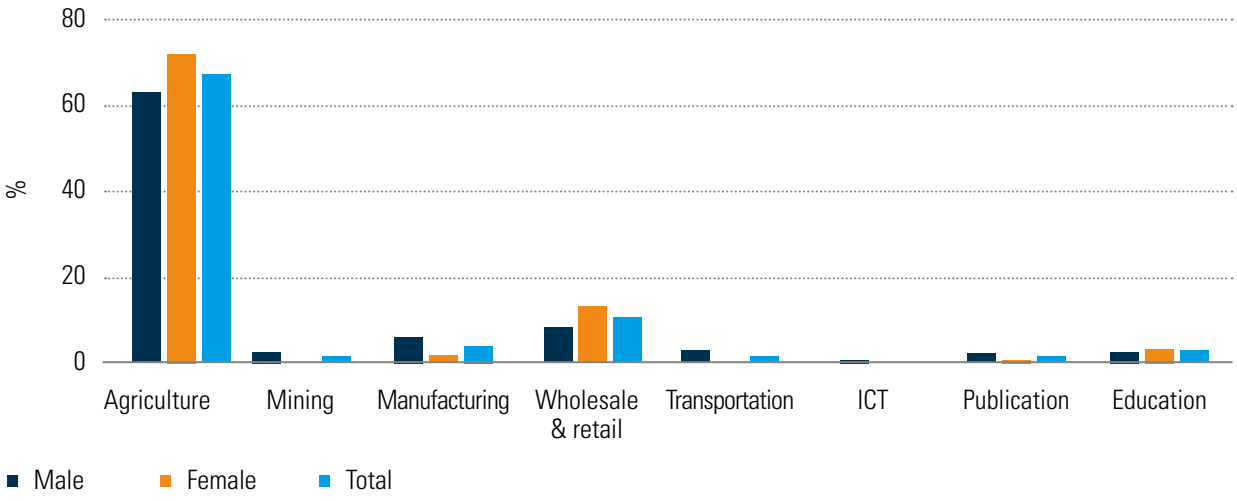


Source: Labour Force Survey, 2014

16. Weak urban labor markets appear to be pushing workers into the rural sector. A joint analysis by the World Bank and the Zimbabwe National Statistics Agency (ZimStat) found a net movement of 1.14 million people from urban to rural areas between 1994 and 2014. While the agricultural sector has successfully absorbed excess urban labor, marginal labor productivity in agriculture is well below that of the industrial or service sectors. Moreover, this influx of additional labor has further diminished marginal labor productivity in the agricultural sector: value added per agricultural worker fell from around US$800 in 1999 to US$400 by 2014, far below the US$7,000 added by workers in the industrial sector. As the urban unemployment rate has risen, an increasing share of urban workers has turned to self-employment. The weakness of urban labor markets is likely reducing demand for various high-level skills typically associated with growth and modernization in the industrial and service sectors.

17. The concentration of Zimbabwe's workforce in the agricultural sector is inhibiting the country's structural economic transformation. The rural economy employs 67 percent of Zimbabwe's workforce. Zimbabwe was once a continental leader in agricultural production, but years of economic turmoil have greatly diminished the marginal productivity of Zimbabwean agriculture. The wholesale and retail subsectors are the country's second-largest employers, accounting for a combined 10 percent of the employed workforce, followed by manufacturing (4 percent) and education (3 percent). Although the mining sector contributes 60 percent to Zimbabwe's exports, it accounts for just 1.5 percent of the employed workforce. Mining employs 2.7 percent of male workers but just 0.3 percent of female workers (Figure 6).

FIGURE 8 SHARE OF EMPLOYED WORKERS BY INDUSTRY OR SECTOR, 2014



Source: Labour Force Survey, 2014

18. The agricultural sector continues to expand and remains Zimbabwe's largest and most stable employer, while mining and manufacturing have stagnated for the past several years. Capacity utilization in the mining sector remains below 70 percent, and while the manufacturing sector suffers from outdated equipment, high capital costs, low aggregate demand, high utility costs, and weak international competitiveness.[9] These factors limit the job-creating potential of the mining and manufacturing sectors, and employment in both sectors shrank as a share of total employment between 2004 and 2014 (Table 2). Restarting growth in the high-productivity mining and manufacturing sectors will be critical to Zimbabwe's structural transformation.

TABLE 5 SHARES OF EMPLOYED WORKERS BY INDUSTRY OR SECTOR

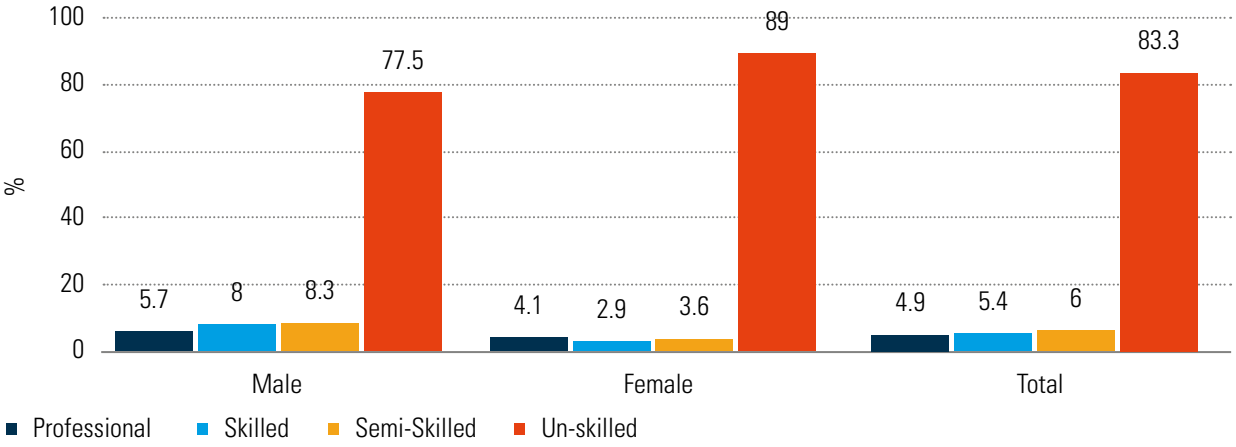
	2004	2014
Agriculture	64.8	67.2
Manufacturing	5.9	4.0
Construction	1.7	1.6
Transport & communication	2.1	2.1
Mining	1.8	1.5

Source: Labour Force Surveys

19. Most of Zimbabwe's employed labor force is classified as unskilled, and the supply of skilled labor likely exceeds demand. In the latest labor-force survey, 83 percent of employed workers were classified as unskilled, up from 79 percent in the 2004 survey. By contrast, skilled workers and professionals together account for just 10 percent of the employed labor force (Figure 7). While in most cases this apparent lack of sophisticated workforce skills would signal that employers were having difficulty finding adequately qualified workers, in the 2014 Enterprise Survey only 6 percent of Zimbabwean firms reported challenges hiring workers with the appropriate skills. Moreover, skilled workers represent over 90 percent of formal wage employees, underscoring the vast size and

low-skilled nature of informal employment. This combination of factors strongly suggests that Zimbabwe's adverse business climate is driving down demand for sophisticated workforce skills, which may be pushing relatively well-qualified workers into unskilled positions in the informal sector or prompting them to emigrate.

FIGURE 9 EMPLOYED WORKERS BY SKILL LEVEL, 2014



Source: Labour Force Survey, 2014

20. A significant share of Zimbabwe's workforce is employed abroad, both in southern Africa and overseas. South Africa is the primary destination country for Zimbabwean migrants. ZIMSTAT's 2016 Country Migration Report found that of all migrants who had left the country since 2009, nearly 32.5 percent were skilled agricultural, forestry, or fishery workers, while 9.7 per cent were skilled services and sales workers. Of those migrants who were employed abroad, 2 percent were professionals, 1.2 percent were technicians and associate professionals and 0.7 percent were managers. Nearly 73 percent of migrants had some secondary education, while 6.7 percent had post-secondary qualifications. These figures illustrate the scale of the human capital lost to emigration between 2009 and 2014, as well as the potential boost that return migration could provide to an economic recovery.

21. Prior to the new administration, Zimbabwe's tertiary sector suffered from a lack of strategic planning, which was exacerbated by the country's economic crisis. The most urgent priority for revitalizing the sector, therefore, is to elaborate a bold vision for its development. This strategy should set targets for the overall size of the tertiary sector and its institutional configuration in line with the government's overarching goal of producing highly qualified graduates and valuable research to support Zimbabwe's economic recovery. In this context, the Education 5.0 document prepared by the MHTESTD establishes a sound framework for elaborating a comprehensive vision for the tertiary education sector. Once articulated, Zimbabwe's strategic vision must be operationalized through a comprehensive master plan.

The Government's Transitional Stabilization Program

22. The new administration, which took office in July 2018, is striving to rebuild the Zimbabwean economy and achieve the goal of making Zimbabwe a "prosperous and empowered upper-middle-income society" by 2030.[11] This initiative, articulated in the government's Vision 2030 strategy, is in line with Zimbabwe's commitments under the Sustainable Development Goals and the AU Agenda 2063. The overarching objective of Vision 2030 is to achieve a broad-based improvement in the livelihoods of Zimbabweans by improving access to basic services

and facilitating robust and sustainable income growth. The government is currently implementing the Transitional Stabilization Programme (TSP), which will run from October 2018 to December 2020, to establish the groundwork for the country's long-term development.

23. The TSP focuses on macroeconomic and financial-sector stabilization, private-sector-oriented policy and institutional reforms, and infrastructure investment. The TSP's five pillars include: (i) governance; (ii) macroeconomic stability and financial reengagement; (iii) inclusive growth; (iv) infrastructure and utilities; and (v) social development. The TSP represents the first stage of Vision 2030, and the second and third stages will be implemented through two five-year national development plans covering the 2020-25 and 2025-30 periods.

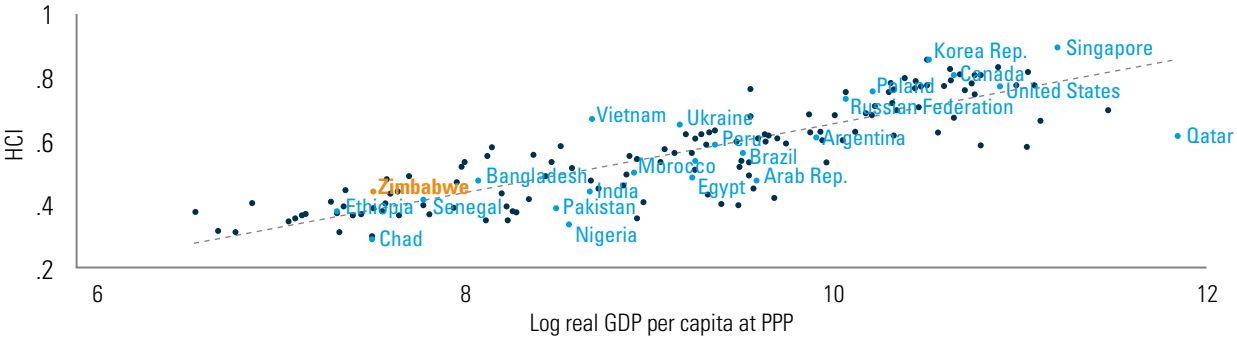
Education Sector Context

24. Education and training drive human-capital formation, and human capital is a key determinant of economic, demographic, social, and health outcomes at the national, regional, and household levels. The World Bank's Human Capital Index (HCI) measures the extent to which a child born today is expected to achieve his or her lifetime productive potential (Box 1). Zimbabwe's human-capital indicators exceed the average for its region and income group (Figure 8). Zimbabwe's performance on the HCI's education dimension is strong by the standards of peer countries, but relatively weak in global terms. A Zimbabwean child who starts school at age four can expect to complete 10 total school years, but only 6.3 learning-adjusted school years, by age 18, indicating a learning gap of 3.7 years (Figure 8).

BOX 1 THE HUMAN CAPITAL INDEX (HCI)

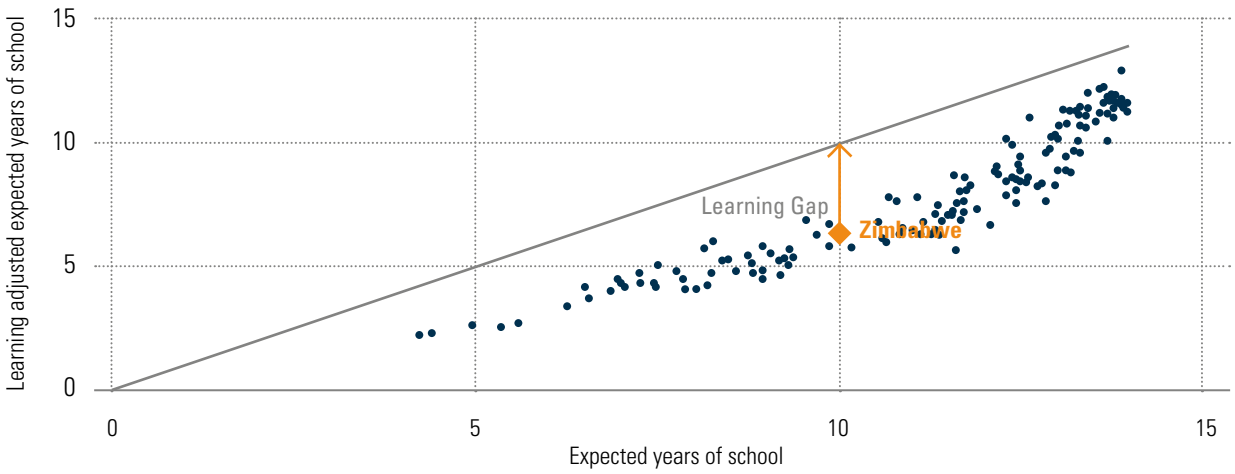
The HCI encompasses three dimensions of human capital: (i) survival, as measured by the under-five mortality rate; (ii) education, as measured by the expected number of learning-adjusted school years; and (ii) the health environment, as measured by the rate of stunting among children under age 5 and the share 15-year-olds who are expected to reach the age of 60. The index ranges from 0 to 1, where a score of 1 indicates no under-five mortality, 14 learning-adjusted school years by age 18, no stunting, and a 100 percent adult survival rate. The HCI's components are designed to reflect the contribution of survival, health, and education to worker productivity. For example, a score of 0.70 would suggest that a child born today will reach 70 percent of his or her potential lifetime productivity. At the national level, a score of 0.70 would indicate that the GDP per worker of the next generation will reach 70 percent of its potential.

FIGURE 10 HUMAN CAPITAL INDEX SCORES AND GDP PER CAPITA, ZIMBABWE AND COMPARATORS



Source: World Bank

FIGURE 11 LEARNING GAP, ZIMBABWE AND COMPARATORS

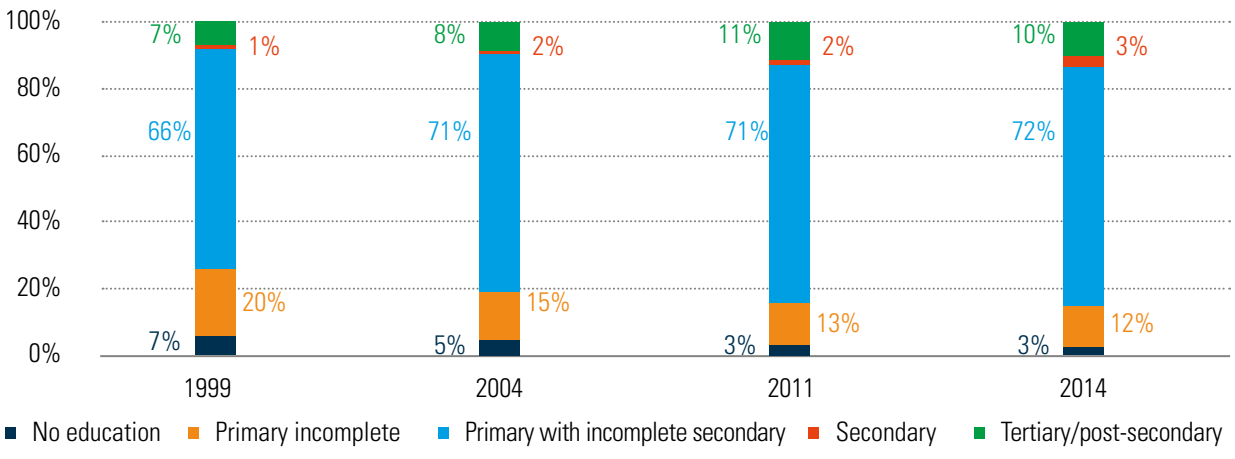


Source: World Bank

Educational Attainment among the Working-Age Population

25. Zimbabwe's workforce is well educated by regional standards. As of 2014, a large majority of Zimbabweans between the ages of 15 and 64 had completed primary education, as well as some amount of secondary education, and roughly 10 percent had at least some tertiary education. Zimbabwe's educational profile is relatively sophisticated, both by the standards of comparable countries and in relation to the largely rural character of the Zimbabwean economy. As rural jobs continue to be the main source of employment in Zimbabwe, most workers are likely to be engaged in occupations that require skills commensurate with, or below, their level of education. The aggregate level of education attainment among Zimbabwe's workforce has gradually improved over the past two decades, with marginal increases in secondary and tertiary educational attainment and a steady decline in the share of non-educated workers (Figure 10).

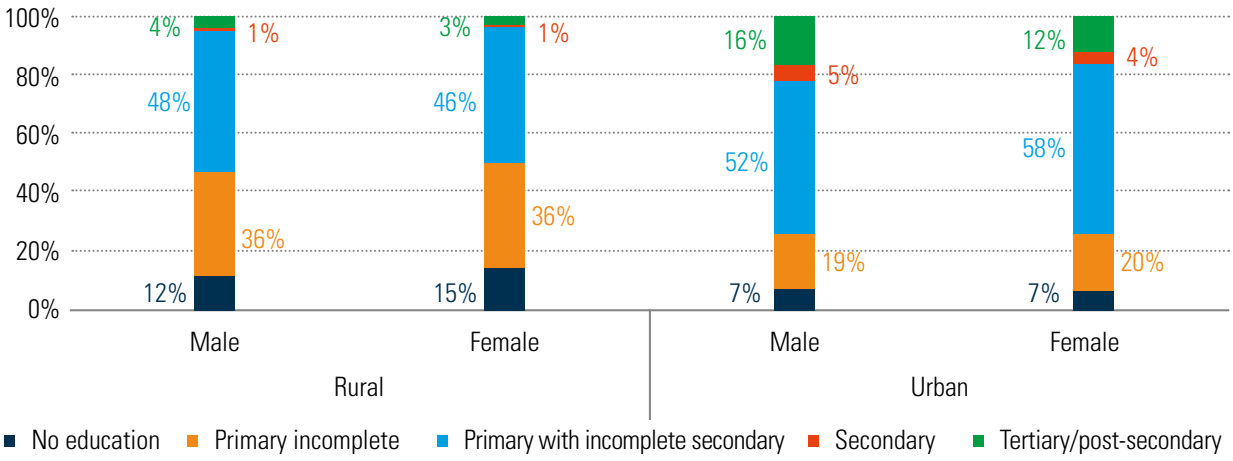
FIGURE 12 EDUCATIONAL ATTAINMENT IN ZIMBABWE, 1999-2014



Source: Jobs Diagnostic, 2017

26. Gains in educational attainment over the last 20 years have been concentrated among the urban population, with little improvement observed among the rural workforce. The share of the urban adult population with at least some amount of tertiary education rose from 6 percent of men and 4 percent of women in 1999 to 16 percent of men and 11 percent of women in 2014. Meanwhile, average levels of educational attainment among rural adults have remained low and broadly stable, with roughly 5 percent of men and 3 percent of women having some amount of tertiary education (Figure 11).

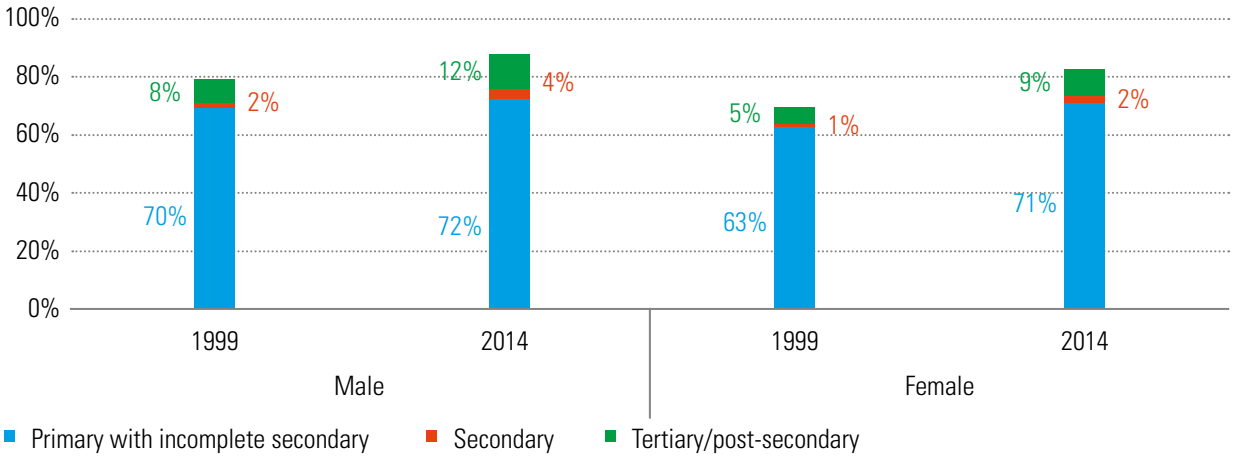
FIGURE 13 EDUCATIONAL ATTAINMENT BY GENDER AND RURAL/URBAN LOCATION, 2014



Source: Jobs Diagnostics, 2017

27. Gender parity in educational attainment has steadily improved over the past decade, but a significant gender gap persists at the tertiary level. As of 2014, the shares of men and women with some amount of secondary education were broadly equal. The shares of female adults with no education or only primary education continue to shrink, while the share with tertiary education is expanding. Nevertheless, the educational attainment gap remains widest at the tertiary level (Figure 12).

FIGURE 14 EDUCATIONAL ATTAINMENT BY GENDER, 1999-2014



Source: Jobs Diagnostics, 2017

The Organization of Zimbabwe's Education Sector

Early Childhood, Primary, and Secondary Education

28. Since achieving independence in 1980, Zimbabwe has implemented an Education for All policy that aims to ensure all school-age children have access to affordable education. Zimbabwe invests about 11 percent of its GDP in education, among the largest shares in Africa, and its emphasis on basic education helped push Zimbabwe's literacy rate to 89 percent in 2014, one of the highest rates on the continent.[12] Demand for education is strong in Zimbabwe, and households bear the largest share of the nonwage education budget in the form of school fees and tuition.[13] The Ministry of Primary and Secondary Education (MOPSE) oversees the basic education subsector, which extends from early childhood development (ECD) to upper-secondary school.

29. Basic education in Zimbabwe is divided into four levels. The first is the infant school module, which comprises two years of ECD and Grades 1 and 2. The second is the junior education module, which encompasses Grades 3-7. All students sit for the national Grade 7 examinations, but the transition from primary school to secondary school is not based on exam performance. The third level is lower secondary, which spans Form 1 to Form 4 (Grades 8-11), at the end of which students sit for the national "ordinary level" (O-level) examinations. The fourth level of the education system comprises two additional years of upper secondary education, which is attended by a small share of students, who may also sit for "advanced level" (A-level) examinations. The transition from the lower secondary to upper secondary is based on students' performance on the O-level exams and passing scores in 5 O-level subjects are required to enter upper secondary. Upper-secondary schools are highly competitive and graduates often go on to attend universities or other higher-education institutions, while lower-secondary graduates are more likely to either attend polytechnics, technical colleges, teacher's colleges, agricultural colleges, and other training institutions, or to enter the job market directly. The Zimbabwe School Examinations Council (ZIMSEC) administers the Grade 7, O-level, and A-level examinations.

30. Zimbabwe's basic education subsector is still recovering from the effects of the 2000-2008 economic crisis. Since 2009, the government has made steady progress in restoring basic education services. Public funding for primary and secondary education increased from 2 percent of GDP in 2009 to about 5.4 percent of GDP in 2013, then eased to 4.6 percent in 2018. Over the past five years, education has received the largest share the national budget, averaging 20 percent of total spending.

31. Driven by the robust investment in education made by the government, households, and donors, the Grade 7 pass rate rose from 49.6 percent in 2012 to 55.6 percent in 2014 and remains on an upward trajectory. O-level pass rates have also improved but remain relatively low at 29.96 percent in 2017. More than two-thirds of candidates fail to achieve passing scores in five O-level subjects, including Math and English, suggesting that interventions at the lower-secondary level should focus on improving education quality.

32. School attendance has steadily increased. In 2017, the gross enrollment rate (GER) and net enrollment rate (NER) at the primary level were 105.6 and 89.9 percent, respectively, and the gender parity index (GPI) for both was close to 1.00. The GER and NER at the lower-secondary level were 76.9 percent and 55.5 percent, respectively, with GPIs of 1.01 and 1.12, respectively. ECD has been fully integrated into the primary school system, and 99 percent of primary schools have ECD classes. However, participation rates are relatively low: in 2017, the GER for ECD was 55.9 percent, and the NER was 32.0 percent, but both are steadily improving. Meanwhile, completion rates for ECD rose from 66 percent in 2012 to 93.7 percent in 2017.

33. The demand for basic education continues to increase. Between 2013 and 2017, the student-to-classroom ratio for ECD rose from 38.4:1 to 68:1, while the ratio for primary school increased from 42.6:1 to 45:1. Public investment in educational facilities has failed to keep pace with rising enrollment rates, leading to the introduction of "hot sitting" or "double shifts"[14] in 41 percent of primary schools and 36 percent of secondary schools. A 2015 school-mapping exercise by the Ministry of Primary and Secondary Education (MoPSE) revealed that 2,056 new schools will be required to decongest the current school system, and an additional 33,636 classrooms are needed in existing schools. Moreover, the country's educational infrastructure urgently needs

renovation, as well as accessibility improvements for students with disabilities.

34. The development of Zimbabwe's primary and secondary education subsectors is guided by the Education Sector Strategic Plan (ESSP), which was formulated in 2015 and covers the 2016-2020 period. The ESSP is designed around four strategic pillars: (i) Education Access; (ii) Learning Quality and Relevance; (ii) Student-Focused Teacher Development; and (iv) Leadership and Management. Most ESSP activities are being implemented with support from the Global Partnership for Education (GPE), with annual performance reviews based on indicators covering lower-secondary gross enrolment, retention rates for female students through Form 4 (Grade 11/O-level), overall Grade 7 pass rates, and Grade 7 Math pass rates in target districts.

35. The MOPSE is in the process of aligning the country's education policy framework with the objectives of the ESSP. The MOPSE has finalized amendments to the Education Act and developed the Information and Communications (ICT) in Education Policy[15] and the School Feeding Policy as part of the policy framework provided under the ESSP. A School Financing policy is also being finalized which will aim to simplify and clarify the uses of all funds at the school level and ensure that there is a transparent accountability for the use of the funds.

Tertiary Education

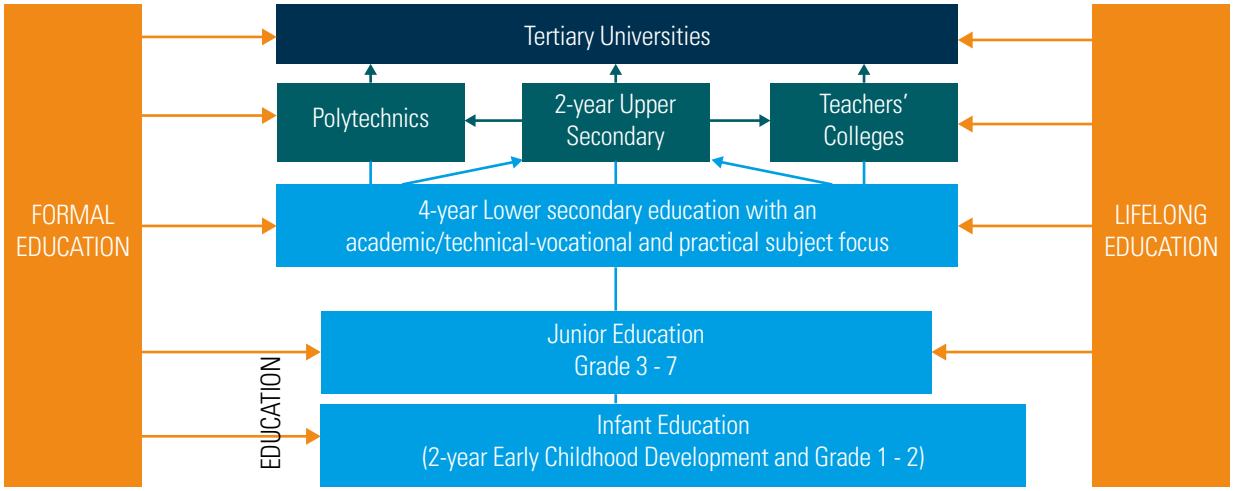
36. The Ministry of Higher and Tertiary Education, Science and Technology Development (MHTESTD) manages the postsecondary education subsector. The MHTESTD formulates and implements skills training and development policies and promotes science, technology and innovation. The ministry oversees, regulates, and registers all public and private universities, polytechnics, and teacher training colleges (Figure 13).

37. Universities: Fourteen state universities and seven private universities currently operate in Zimbabwe. Each of the country's 10 administrative provinces has at least one state university. University applicants must pass at least 2 A-level subjects, and additional entry requirements vary by institution and area of study. All but one of Zimbabwe's universities were founded after 1987, though several current universities were previously polytechnics or teacher training colleges.

38. Technical and Vocational Education and Training (TVET) Institutions: Zimbabwe has 7 polytechnic colleges, which focus on providing technical and vocational education and training (TVET). Some polytechnics also offer programs in non-TVET subject areas such as commerce and applied sciences. Applicants to polytechnics must pass five O-level subjects and meet additional requirements based on their areas of study. Several industrial TVET centers offer certifications in various trades and professional competencies. These facilities both train students who have not yet entered the labor force and provide upskilling courses for employed workers. Some training institutions have no academic entry requirements, but instead focus on acquired skills and experience, which are assessed through specialized testing.

39. Teacher Training Colleges: Zimbabwe has 13 teacher training colleges: 10 focus on primary education, and three specialize in secondary education and TVET. Applicants for the 10 primary-focused teacher training colleges must pass five O-level subjects, including Math and English, while applicants to the secondary-focused colleges must pass two A-level subjects. All teacher training colleges are regulated by the Department of Teacher Education at the University of Zimbabwe (UZ), which awards education diplomas to graduates. Universities also offer bachelor's degrees in education, though at a much smaller scale than the teacher training colleges.

FIGURE 15 DIAGRAM OF ZIMBABWE'S EDUCATION SECTOR



Source: The Ministry of Primary and Secondary Education – Education Sector Strategy Plan pg. 4 shortened MOPSE – ESSP (2016 – 2020) pg. 4

40. The MHTESTD also oversees numerous statutory bodies and agencies. These organizations are tasked with supporting the development of specific aspects of higher and tertiary education, scientific research, and technological development.

41. Established in 2006, the Zimbabwe Council for Higher Education (ZIMCHE) ensures the quality of tertiary education by registering and accrediting institutions. ZIMCHE's mandate is to promote and coordinate the provision of tertiary education and regulate standards for teaching, examinations, academic qualifications, and research in tertiary education institutions. ZIMCHE also oversees the implementation of the National Skills Qualifications Framework, which establishes accreditation and evaluation criteria for tertiary education programs.

42. The MHTESTD administers the Zimbabwe Manpower Development Fund (ZIMDEF), which is designed to support workforce skills development. The Fund is primarily funded through a 1 percent training levy imposed on the gross wage bill of registered companies. ZIMDEF finances the training of apprentices by subsidizing wages, tuition, internships, and examination-related costs. Support for internships is currently limited to polytechnic students due to limited funding and weak economic activity. ZIMDEF has played a pivotal role in infrastructure development at certain tertiary institutions, and key ZIMDEF-supported projects include the construction of Harare Polytechnic Central Library, the construction of the Kwekwe Polytechnic Engineering Workshop, the acquisition of modern automotive equipment for all polytechnics, the commercialization of DNA testing services National University of Science and Technology (NUST), and the establishment of the Chinhoyi University of Technology (CUT) cattle-breeding and artificial-insemination project, inter alia.[16] While there have been repeated reports of the misuse of ZIMDEF funding, the current administration has made significant efforts to enhance its integrity and transparency through improved corporate governance and ongoing restructuring.

43. The Zimbabwe Universities' Vice Chancellors' Association (ZUVCA) and the Zimbabwe Research and Education Network (ZIMREN) are non-statutory bodies created by the country's universities to support the development of tertiary education. ZUVCA commissioned ZIMREN to link Zimbabwe's public and private universities and enable them to jointly access regional and global resources. ZIMREN's specific goals include reducing the cost of university internet access and increasing the available bandwidth to meet the rising demand from students, faculty and researchers.

44. The new administration has increased the use of public-private partnerships (PPPs) in the education sector, especially for infrastructure projects. Major PPP-supported infrastructure investments include student accommodations developed on a build-

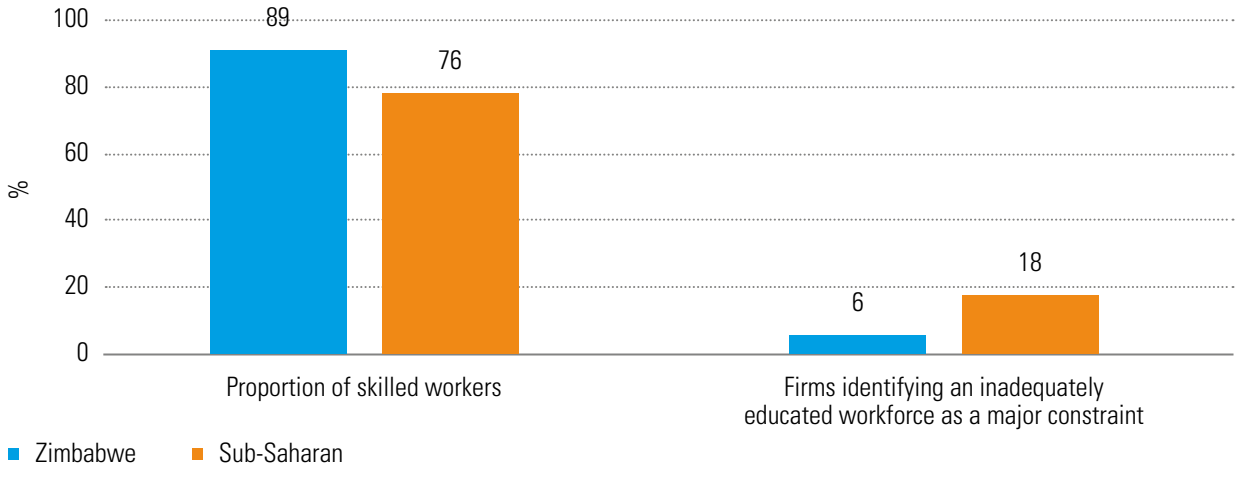
operate-and-transfer (BOT) basis. Some universities, including UZ, are also creating innovation hubs and industrial parks that will strengthen ties between universities and the private sector while serving as incubators for innovations created by students, faculty, and researchers.

Tertiary Education and Workforce Skills Development in Zimbabwe

45. Zimbabwe boasts of an extremely young population with 62% of the population being below the age of 25 years.[17] The overall tertiary education population is thus expected to increase rapidly given the population growth rate of 1.1% between 2002 and 2012. As such, there will be greater demand for higher and tertiary education opportunities due to the expected increase in the population of those eligible for post-secondary education. Low pass rates in O level (average of 30% over the past decade) against a huge and growing youth population may also mean that the country will need to invest in other opportunities that are academically less demanding, but more skills focused, such as those offered by community colleges and TVET centers.

46. At a glance, Zimbabwe's human-capital endowment appears adequate relative to the demands of its economy, but a deeper analysis reveals critical gaps in workforce skills. The aggregate skill level of Zimbabwe's workforce is above the average for Sub-Saharan Africa, and a relatively small share of firms cite inadequate workforce skills as an obstacle to doing business (Figure 14). However, data on employment rates, income levels, and the characteristics of graduates are very limited in Zimbabwe, and the impact of the country's protracted economic downturn distorts the labor market's ability to accurately reflect the quality and relevance of tertiary education.

FIGURE 16 OVERALL WORKFORCE SKILL LEVEL AND THE SHARE OF FIRMS REPORTING AN INADEQUATE SUPPLY OF WORKFORCE SKILLS, 2016



Source: World Bank, Enterprise Survey for Zimbabwe, 2016

Note: The share of skilled workers is computed using data from manufacturing firms only

47. A National Critical Skills Audit was conducted in 2018 to assess Zimbabwe's skills deficits and surpluses in the context of local, regional, and global economic trends. The audit confirmed the existence of large gaps between the supply and demand for skills in several key sectors, with a deficit in the production of qualified specialists and technicians especially in the natural and applied sciences, engineering and technology, the medical and health sciences, and agriculture. In line with the audit's findings, tertiary education institutions have been encouraged to promote the expansion of engineering and technology, the natural and applied sciences, the agricultural sciences, and the medical and health sciences.

48. Zimbabwe's tertiary education system can help boost agricultural productivity and support a gradual transition toward industry and services. The new administration is committed to the development of tertiary education, and the MHTESTD has launched several important new initiatives over the past 18 months. In line with the TSP's emphasis on human-capital development, the government is investing in the construction of new tertiary education institutions and the rehabilitation of existing facilities. The government has also prioritized the expansion of the TVET subsector to address the gaps identified by the workforce skills audit.

Strategic Planning in the Tertiary Education Sector

49. The MHTESTD has recently adopted a new higher education development strategy called the Education 5.0 Doctrine. The doctrine seeks to improve the market relevance of tertiary education and enhance its contribution to the country's economic recovery by refocusing the tertiary education subsector on five priorities: (i) teaching; (ii) research; (iii) community service; (iv) innovation; and (v) industrialization. This doctrine's emphasis on innovation and industrialization is a new element of Zimbabwe's higher education strategy.

50. The government has created a National Qualifications Framework designed to create a harmonized system of educational qualifications. The MHTESTD has begun to standardize academic credentials and facilitate the movement of students between institutions. It has also introduced standards for the recognition of prior learning at the undergraduate and postgraduate levels.

Summary

Zimbabwe's unstable macro-fiscal environment, resulting from the country's political and economic crisis of the last decade, has severely impeded its development. The new administration, which took office in July 2018, is striving to rebuild the Zimbabwean economy. In spite of the political and macro-economic crisis of the last decade, Zimbabwe's human-capital indicators exceed the average for its region and income group.

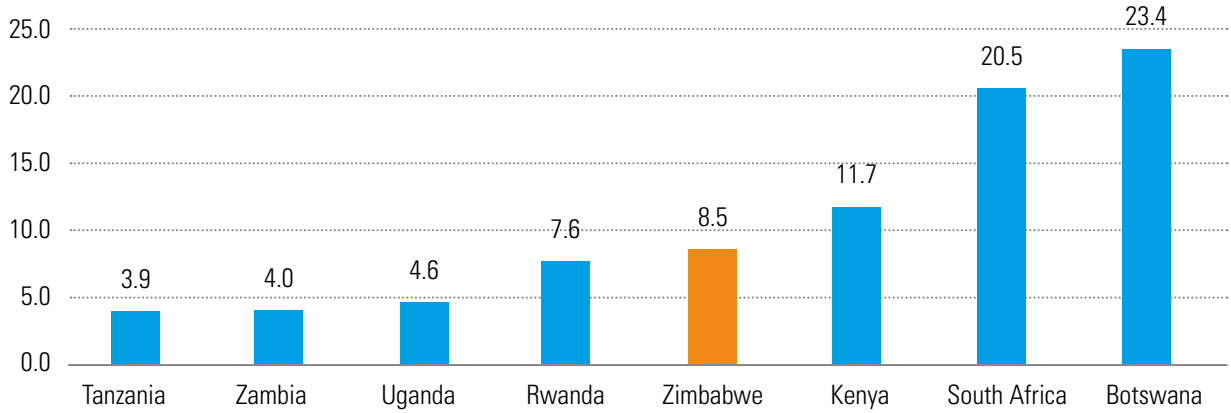
The Ministry of Higher and Tertiary Education, Science and Technology Development (MHTESTD), which manages the postsecondary education subsector, has recently elaborated a key strategic document entitled Education 5.0. This document establishes a sound framework for elaborating a comprehensive vision for the tertiary education sector.

04 THE PERFORMANCE OF ZIMBABWE'S TERTIARY EDUCATION SECTOR

Tertiary Enrollment Rates and Equity Indicators

51. At 8.5%, Zimbabwe's tertiary enrollment rate is yet to match the level of regional leaders, such as Botswana, South Africa and Kenya. Zimbabwe's tertiary GER rose from 6 percent in 2010 to 8.5 percent in 2015, significantly above Zambia's rate but still well below Kenya's (Figure 15). Zimbabwe's tertiary enrollment rate has continued to increase despite deteriorating public investment in education, underscoring the strong demand for tertiary education among Zimbabwean households. Zimbabwe's secondary education rate is also high by regional standards, and in 2013, the country's secondary GER and NER stood at 47 percent and 44 percent, respectively. The substantial disparity between secondary and tertiary enrollment rates may indicate that the supply of tertiary education is insufficient to meet demand.

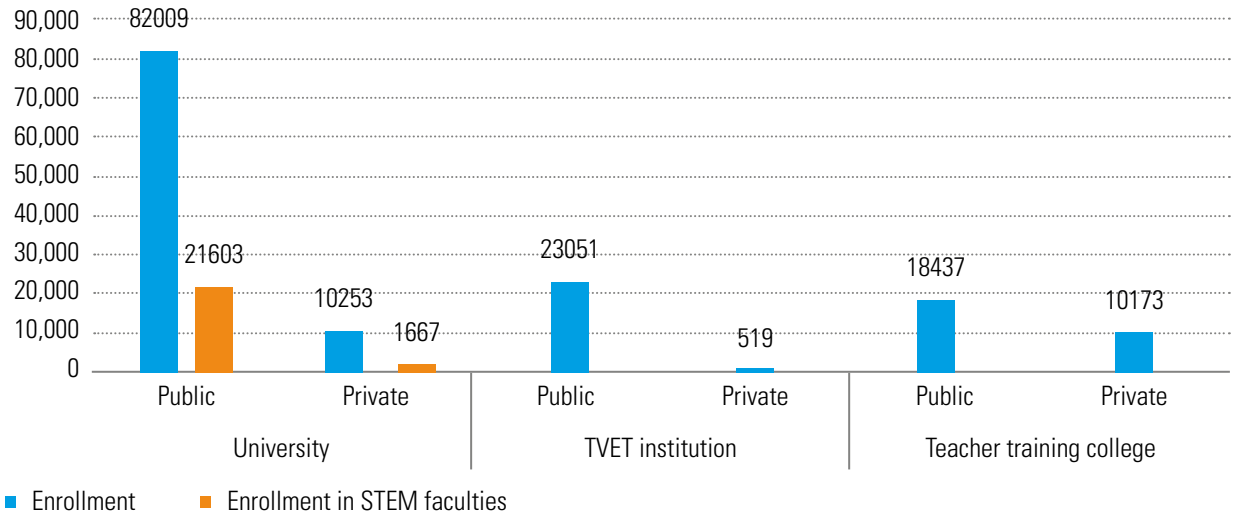
FIGURE 17 GROSS ENROLLMENT RATES IN TERTIARY EDUCATION, ZIMBABWE AND COMPARATORS, LATEST AVAILABLE YEAR (%)



Source: World Bank Data Bank – Education Statistics

52. A large majority of tertiary students are enrolled in public institutions. While Zimbabwe has six private universities, public universities accounted for about 90 percent of total university enrollment in 2017 (Figure 16). Public TVET institutions and public teacher training colleges also dominate their subsectors, accounting for 98 and 64 percent of total enrollment, respectively. More than a third of the country's teacher training colleges are private. Private TVET institutions tend to be much smaller than the public colleges.

FIGURE 18 ENROLLMENT IN PUBLIC AND PRIVATE UNIVERSITIES, TVET INSTITUTIONS, AND TEACHER TRAINING COLLEGES, 2017

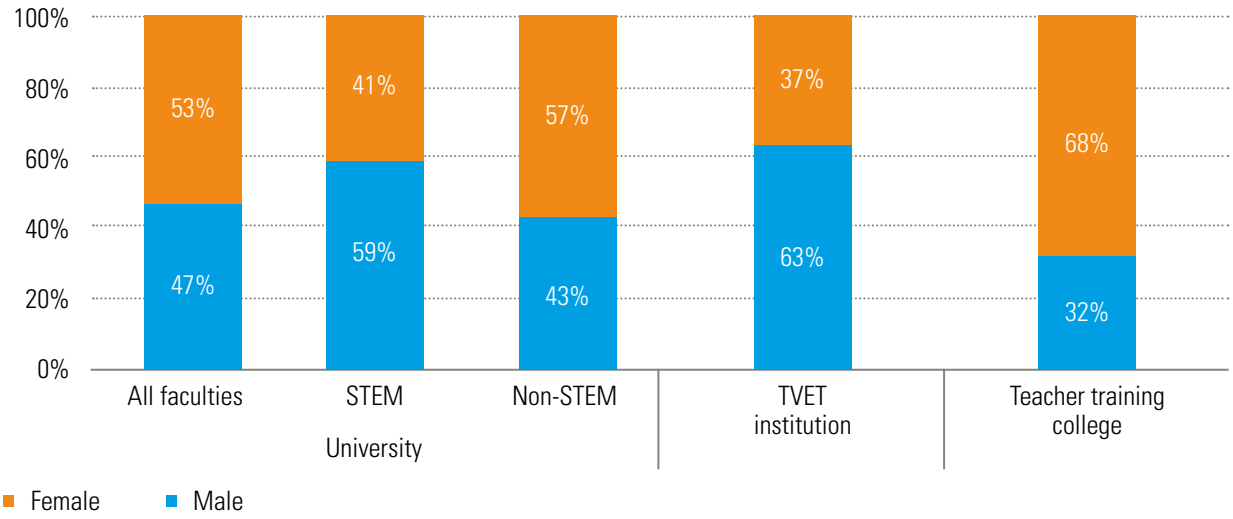


Source: Zimbabwe Council for Higher Education (ZIMCHE)

53. Infrastructure constraints and tuition fees limit tertiary education access. The first issue is physical infrastructure. Teaching space and affordable accommodations on and around tertiary institutions are very scarce. Tuition fees for public institutions are also a significant deterrent for students from poorer households, and the country lacks a viable and sustainable financial-support system for tertiary students. For instance, Great Zimbabwe University charges $600 annually for tuition and other fees for studying Bachelor of Arts program. NUST charges $565 for Applied Sciences program. Dormitory fees will be added on this for residential students who stay at on-campus residential facilities. Such fees are by no means insignificant for a country with per capita GDP of around US$1,300.

54. While the overall gender gap at the tertiary level is very modest in 2017, male students continue to dominate certain fields of study. Critically, female students account for around 40 percent of total enrollment in science, technology, education and mathematics (STEM) fields. More female students enrolled in the humanities and social sciences and teacher training colleges, but female students make up just 37 percent of total enrollment in TVET institutions (Figure 17).

FIGURE 19 ENROLLMENT IN ACADEMIC DISCIPLINES BY GENDER, 2017

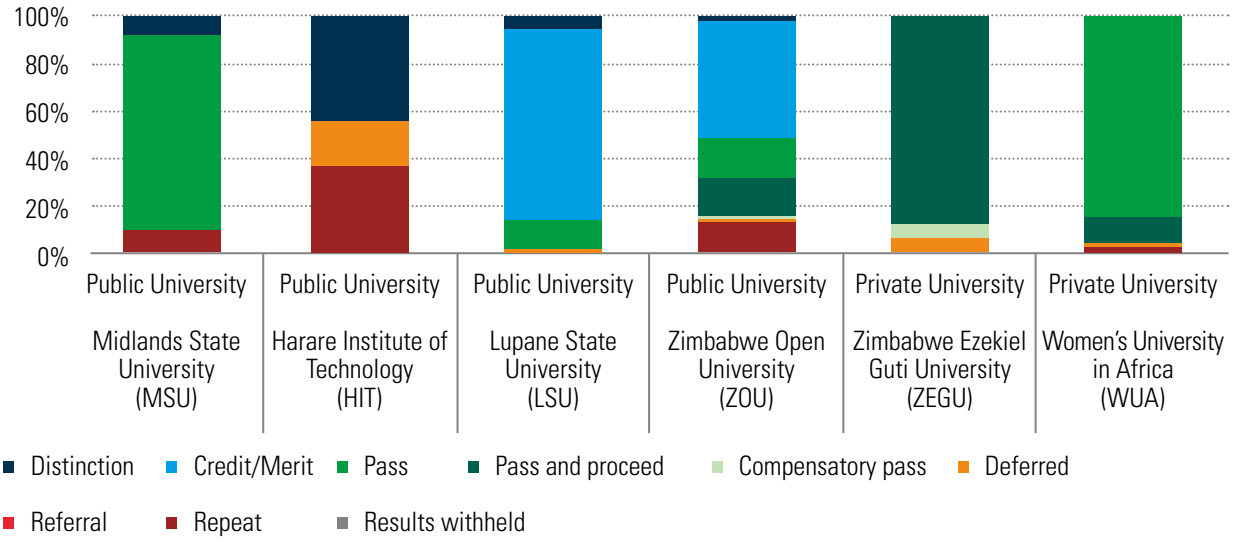


Source: ZIMCHE

Repetition and Dropout Rates

55. A questionnaire submitted to Zimbabwe's tertiary education institutions found that repetition rates are generally low among both public and private universities, with the notable exception of the STEM-oriented public universities. Harare Institute of Technology (HIT) has a relatively high repetition rate (Figure 18). This may reflect the high academic standards of the institution, combined with the inadequate preparation of incoming students.

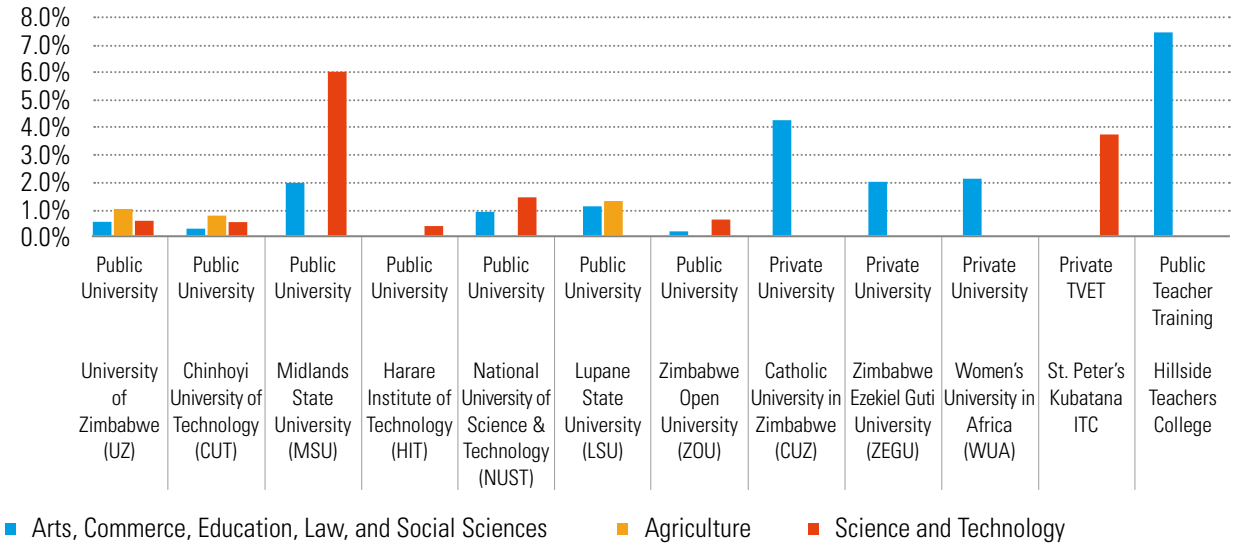
FIGURE 20 EXAMINATION RESULTS BY INSTITUTION, 2018



Source: 2018 World Bank Survey

56. High tuition fees contribute to significant dropout rates in public universities. The questionnaire found that nearly 70 percent of dropouts in some institutions cited tuition fees as the main reason for drop out. Students enrolled in STEM fields are especially likely to drop out due to high tuition costs, which may contribute to the lower-than-average graduation rates of STEM students in some public universities. High dropout rates are also observed in non-university institutions. Dropout rates at private universities are also especially high, and roughly 40 percent of private university dropouts cited tuition fees as the reason for terminating their studies (Figure 19, Figure 20, and Figure 21).

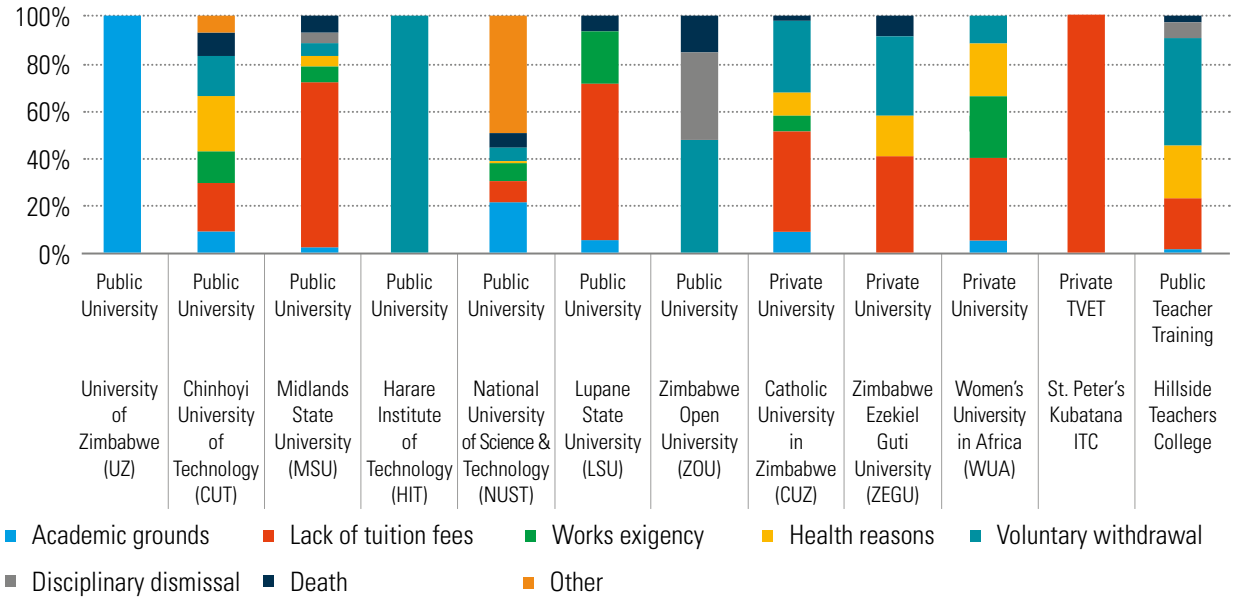
FIGURE 21 DROPOUT RATES BY DISCIPLINE AND INSTITUTION, 2017



Source: 2018 World Bank Survey

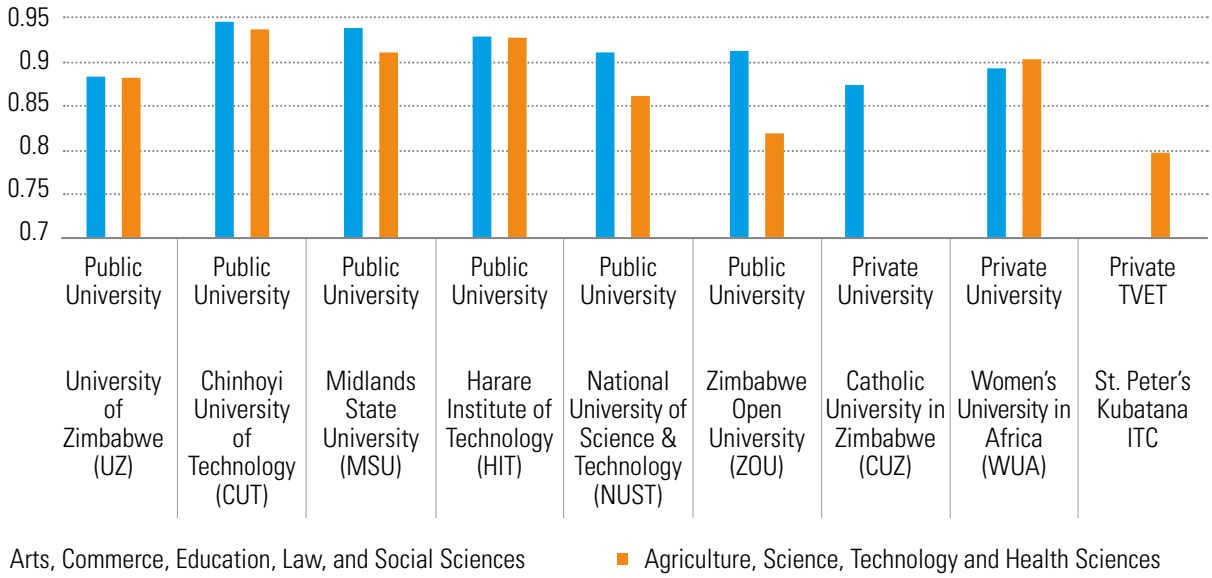
Note: The dropout rate is the number of dropouts as a share of total enrollment in 2017

FIGURE 22 REPORTED REASONS FOR DROPPING OUT BY INSTITUTION, 2017



Source: 2018 World Bank Survey

FIGURE 23 GRADUATION RATES BY INSTITUTION, 2017



Source: 2018 World Bank Survey

Note: Graduation rate was calculated by calculated by dividing the number of students entered by the number of students graduated in 2017

Quality and Relevance of Tertiary Education

57. While educational attainment statistics only describe the level of education reached, the quality and relevance of that education profoundly influence its impact on productivity. Whereas enrollment and completion rates offer clear, easily observable metrics of educational attainment, education quality and relevance are can be difficult to measure, especially at the tertiary level. At the primary and secondary levels, standardized tests such as the Trends in International Mathematics and Science Study (TIMMS) and the Program for International Student Assessment (PISA) can reliably gauge student learning, but no comparable instrument is widely used to assess the quality and relevance of tertiary education.[18]

58. In the absence of a direct assessment of learning outcomes, university rankings are often used as a proxy measure of tertiary education quality. Despite their methodological limitations, international rankings can help identify which universities tend to offer a high-quality education, produce graduates who excel in the labor market, and support valuable academic and scientific research. While two of the major university-ranking systems, the Shanghai Academic Ranking of World Universities and the Times Higher Education World University Ranking, do not include any Zimbabwean university in their lists of the top 800 global institutions, the Webometrics ranking is far more expansive and includes five Zimbabwean universities.[19] However, the Zimbabwean institutions compare poorly to other major universities in Sub-Saharan Africa (Table 3), and only UZ appears among the top 100 African universities in the Webometrics ranking (Table 3).

TABLE 6 WEBOMETRICS UNIVERSITY RANKINGS, ZIMBABWEAN UNIVERSITIES AND COMPARATORS, 2019

Name of University	World Rank
University of Cape Town	272
University of Nairobi	993
Makerere University	1036
University of Ibadan	1148
University of Zimbabwe	**1977**
Midlands State University	**4699**
National University of Science & Technology	**5153**
Chinhoyi University of Technology	**5392**
Bindura University of Science Education	**5473**

Source: Webometrics (2018) http://www.webometrics.info/en

Note: Zimbabwean universities are in bold

TABLE 7 WEBOMETRICS TOP 100 UNIVERSITIES IN SUB-SAHARAN AFRICA, 2019

Country	Number of Universities in the Top 100	Rank of the Top University from Each Country
South Africa	18	1
Kenya	5	9
Uganda	2	11
Nigeria	10	15
Ghana	3	19
Ethiopia	2	21
Tanzania	3	26
Zimbabwe	**1**	**33**
Sudan	1	38
Mozambique	1	39

Source: Webometrics (2019) http://www.webometrics.info/en/Sub-Saharan

59. Several factors undermine the quality of the teaching and learning environment. These include: (i) insufficient academic preparation among incoming students, especially in science; (ii) highly inadequate university laboratories and other specialized educational facilities, which often contain obsolete equipment no longer used in the private sector; (iii) high teacher vacancy rates due to large-scale emigration and a recruitment freeze triggered by the fiscal crisis; (iv) outdated curricular and pedagogical practices, (v) an inadequate number of qualified academic staff to support postgraduate programs, supervise doctoral students, and carry out research; (vi) little participation in international research networks and limited access to digital libraries and international journals; and (vii) a lack of funding for external assessors and an ineffective quality monitoring and evaluation system.

Curricular and Pedagogical Practices

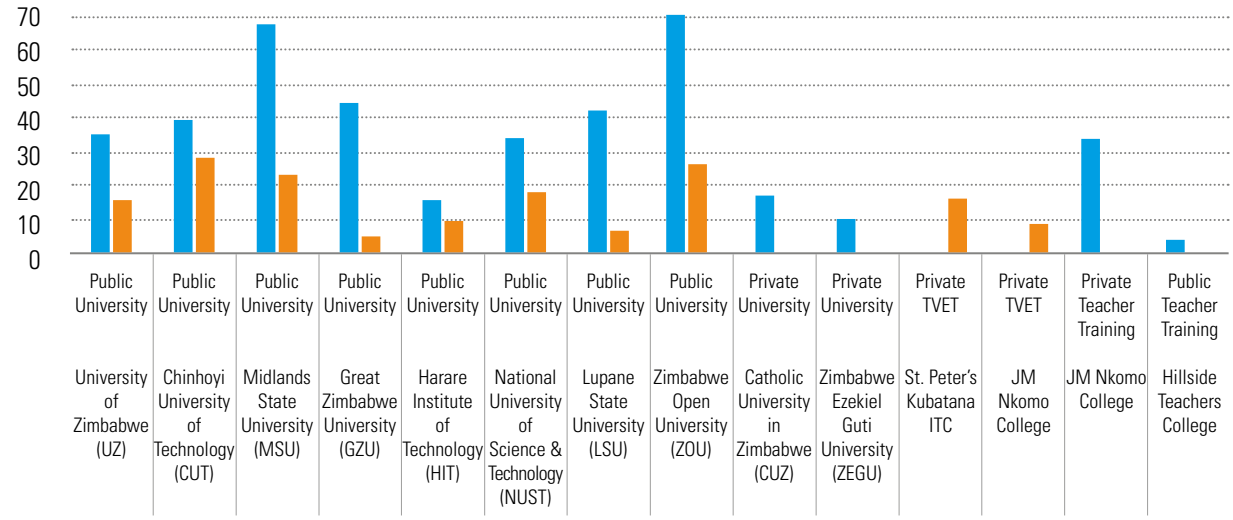
60. Field visits to selected institutions and interviews with key university officials conducted in November 2018 revealed that curricular and pedagogical practices remain largely traditional in many institutions, mostly because faculty lack training in innovative methods.[20] Many programs continue to emphasize rote learning over creative

engagement. However, some institutions, especially the STEM-oriented universities, increasingly offer extended internships to provide their students with hands-on experience and improve their job prospects after graduation. These institutions also offer career services to their students.

Staffing

61. An acute shortage of academic staff, especially in STEM programs in public universities, is negatively impacting education quality. The student-to-faculty ratio exceeds 60:1 at MSU, a public university with the largest number of students in the country (Figure 22). Severe staff shortages are also apparent in some public teacher training colleges. Student-to-faculty ratios in university STEM programs are relatively low, but still high by international standards—especially at large public institutions. Faculty recruitment has not kept pace with growing enrollment levels in both STEM and non-STEM programs. Universities in which only a small share of students are enrolled in STEM programs appear to more easily keep their student-to-faculty ratios low.

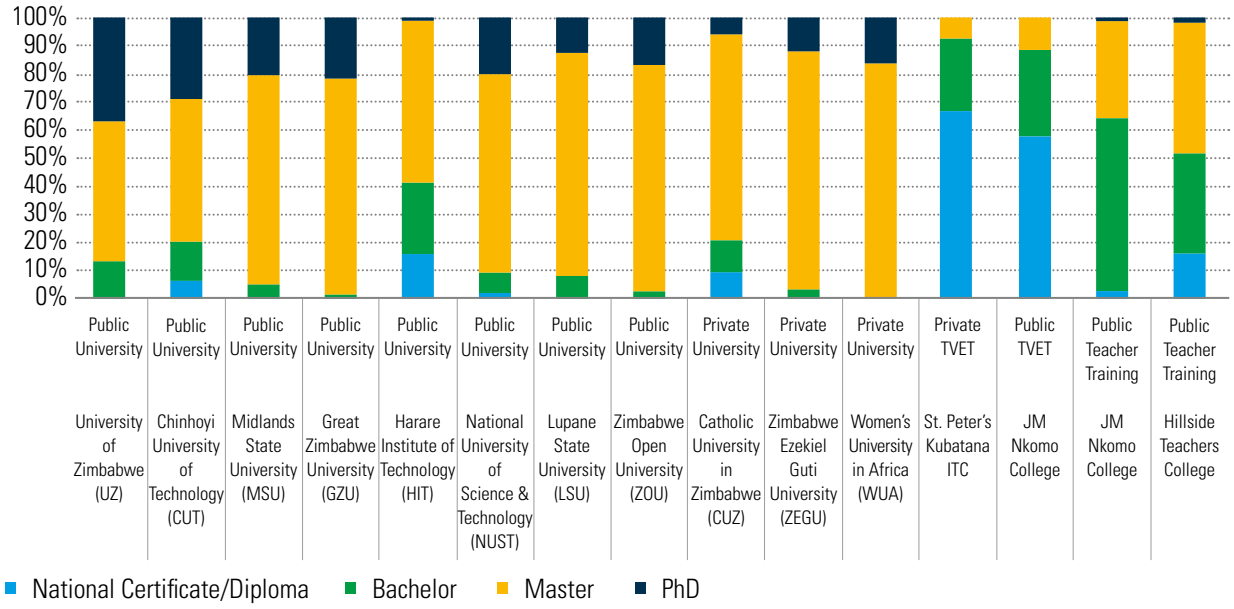
FIGURE 24 STUDENT-TO-FACULTY RATIOS BY INSTITUTION, 2017



Source: 2018 World Bank Survey

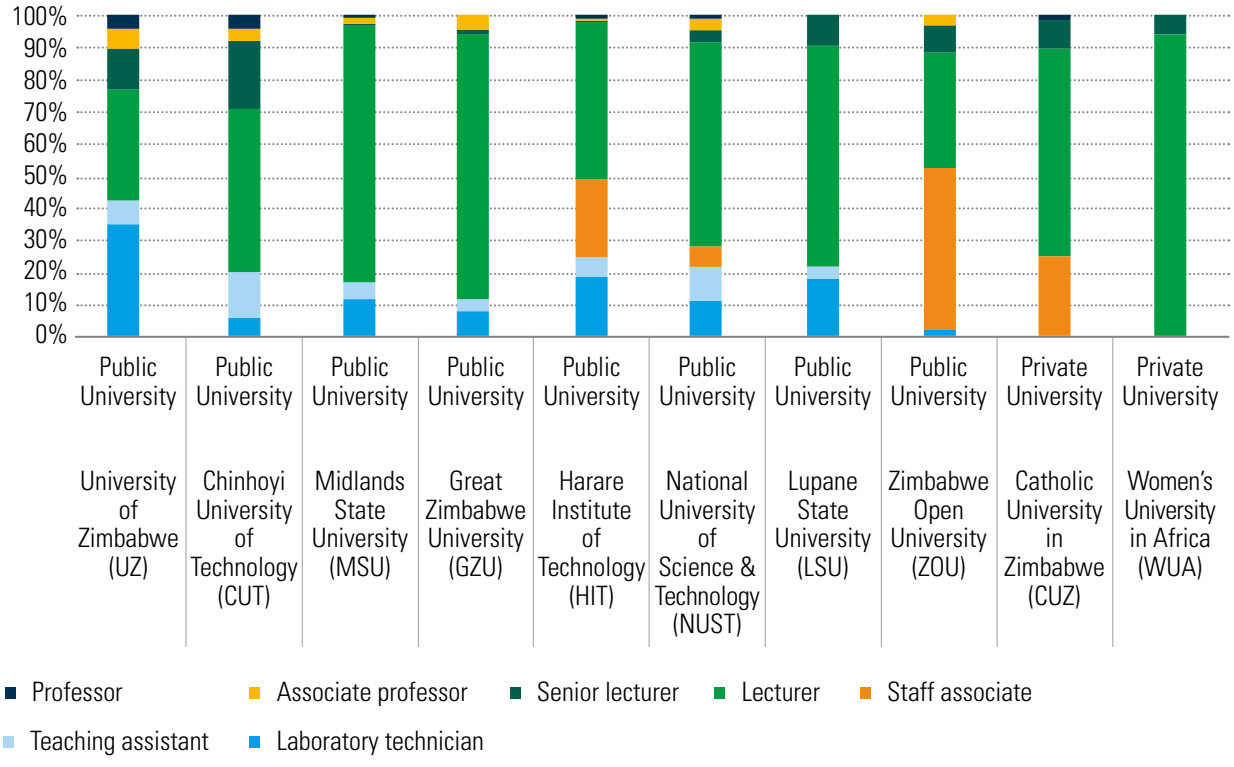
62. Most academic staff in both public and private universities hold master's degrees. Staff qualifications are similar in the humanities and STEM programs. In public universities, the share of academic staff with doctoral degrees increased between 2014 and 2017, while the average qualification level of academic staff in private universities declined. Zimbabwe appears to be gradually recovering from the exodus of qualified academic staff that occurred during the economic crisis. Qualification levels at teacher training colleges and TVET institutions, as well as one small engineering college with no postgraduate programs, are even lower, and many staff hold only diplomas or bachelor's degrees (Figure 23). Most academic staff at Zimbabwean universities are classified as lecturers, and while institutions with more-qualified staff also tend to have higher-ranking staff, few faculty members at any institution rank higher than senior lecturer (Figure 24). The field visits confirmed that the low average academic qualifications of Zimbabwean faculty reflect the emigration of many highly qualified academics to South Africa and other countries in the region.

FIGURE 25 SHARES OF ACADEMIC STAFF BY QUALIFICATION LEVEL AND INSTITUTION, 2017



Source: 2018 World Bank Survey

FIGURE 26 SHARES OF ACADEMIC STAFF BY RANK AND INSTITUTION, 2018

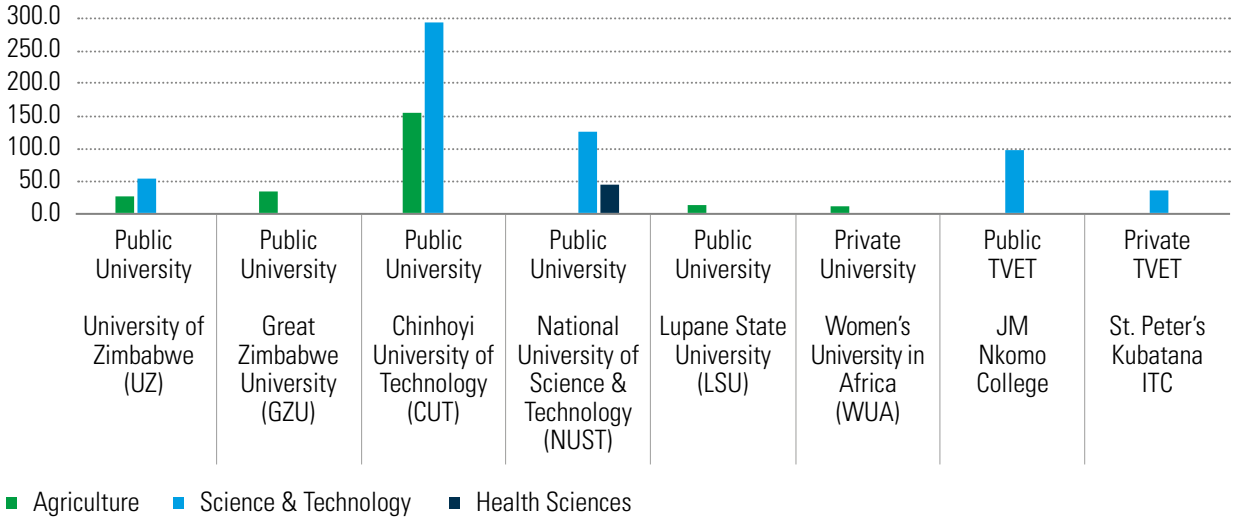


Source: 2018 World Bank Survey

Facilities and Equipment

63. Inadequate laboratories, workshops, and other specialized facilities significantly weaken education quality, especially in STEM programs. The major public universities that responded to the questionnaire reported that a large share of their laboratories and other educational facilities are outdated or in disrepair. Facilities in some TVET institutions appear to be of somewhat better quality, as many have been recently constructed or renovated to accommodate rising enrollment levels. However, their total capacity remains limited (Figure 25 and Figure 26).

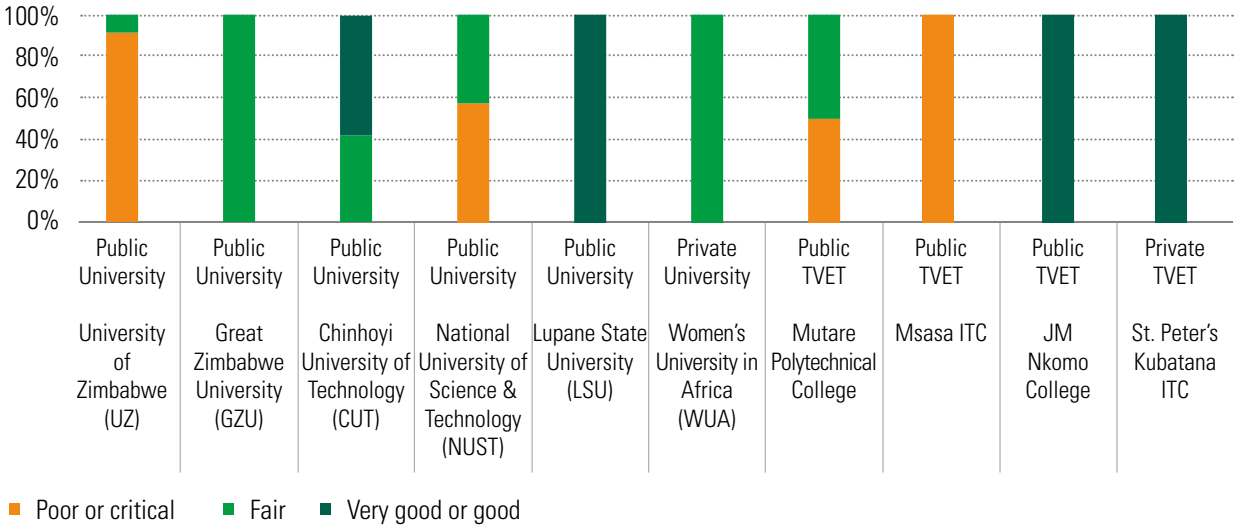
FIGURE 27 NUMBER OF STUDENTS PER LABORATORY OR WORKSHOP BY INSTITUTION, 2018



Source: 2018 World Bank Survey

Notes: This figure shows the number of laboratories/workshops (including those under construction) divided by total enrollment in each discipline during the most recent year for which data are available.

FIGURE 28 CONDITION OF STEM LABORATORIES/WORKSHOPS BY INSTITUTION, 2018

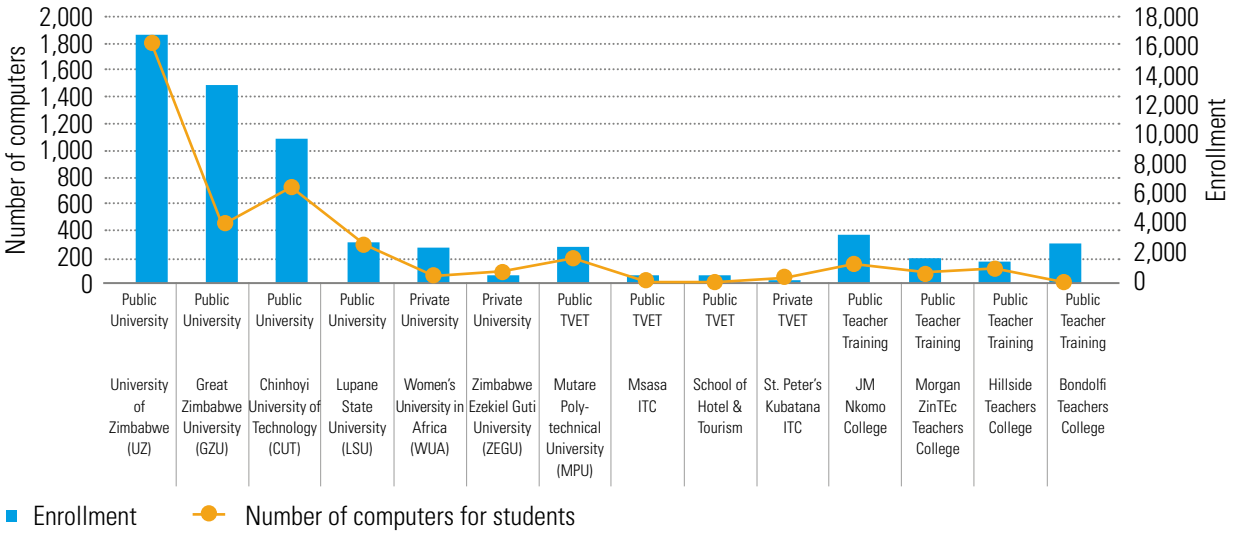


Source: 2018 World Bank Survey

Note: Disciplines shown include agriculture, science, technology, medicine, and health sciences

64. The overall state of computer laboratories at teacher training colleges and TVET institutions is relatively poor. By contrast, Zimbabwean universities typically have computer laboratories for students at both central and program/campus levels. The maximum student-to-computer ratio among the institutions that responded to the questionnaire was 40 (Figure 27). Almost all the universities that responded to the questionnaire reported good internet connectivity, but some computer laboratories at two non-university institutions lacked an internet connection (Figure 28). Both teacher training colleges and TVET institutions reported difficulties hiring computer technicians, whereas universities reported hiring computer technicians for each laboratory to maintain the system and support the students.

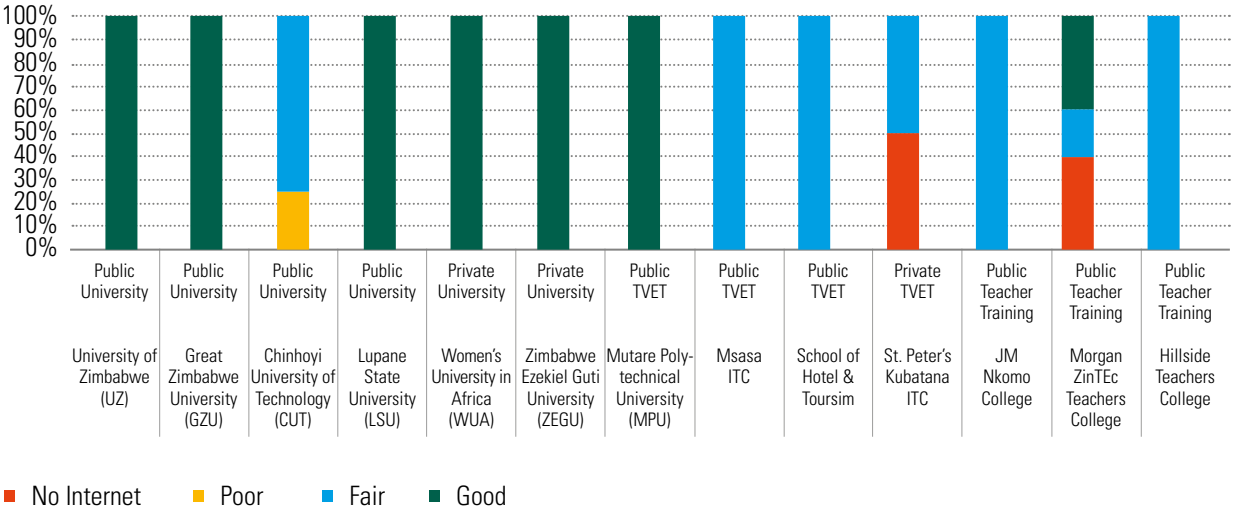
FIGURE 29 NUMBER OF COMPUTERS AND TOTAL ENROLLMENT BY INSTITUTION, 2018



Source: 2018 World Bank Survey and ZIMCHE

Note: Enrollment data are the most recent available. Missing values are imputed based on 2017 ZIMCHE data.

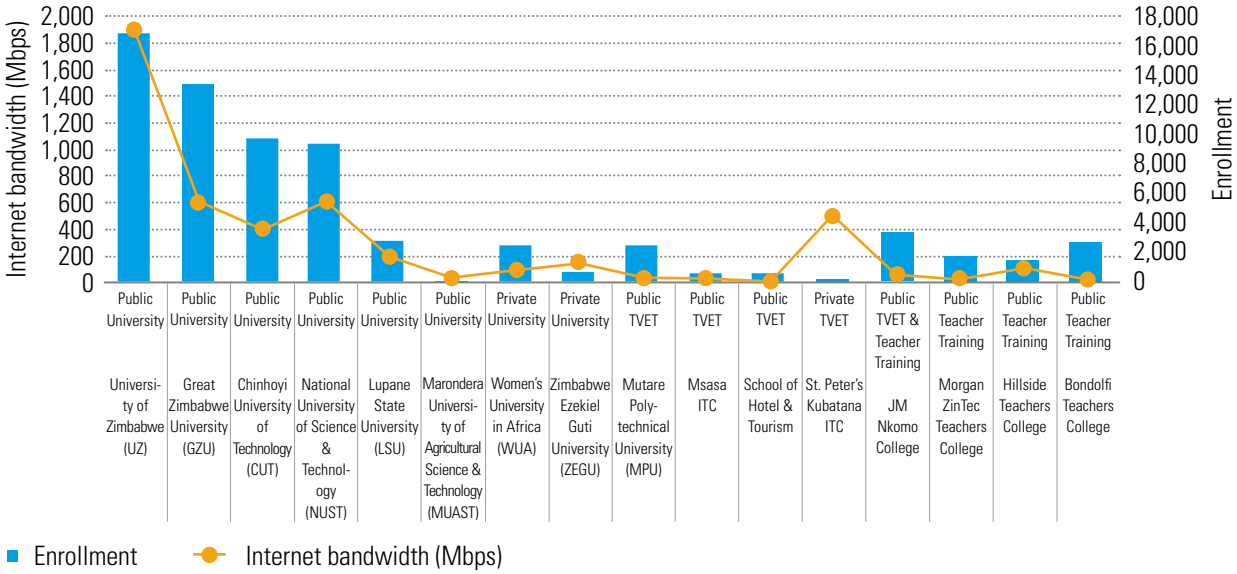
FIGURE 30 REPORTED INTERNET CONNECTIVITY QUALITY OF COMPUTER LABORATORIES, 2018



Source: 2018 World Bank Survey

65. Whereas the universities are benefiting from the recently-launched ZIMREN Internet network, weak internet connectivity at teacher training colleges and TVET institutions limits the use of online educational support, as well as access to online journals, data, and research materials. All the institutions that responded to the questionnaire reported having an on-campus Wi-Fi system, and each purchased internet bandwidth according to its number of enrolled students (Figure 29). However, students at teacher training colleges and TVET institutions reported being unsatisfied with the quality of their campus internet connections (Figure 30). Systems for ensuring network connectivity are also relatively weak. For instance, while all universities have IT specialists, most teacher training colleges and TVET institutions do not. Weak ICT systems inhibit the introduction of online education, management, and support systems in teacher training colleges and TVET institutions (Figure 31) and limit access to online journals and book databases (Figure 32).

FIGURE 31 INTERNET BANDWIDTH OF ON-CAMPUS WI-FI AND TOTAL ENROLLMENT BY INSTITUTION, 2018



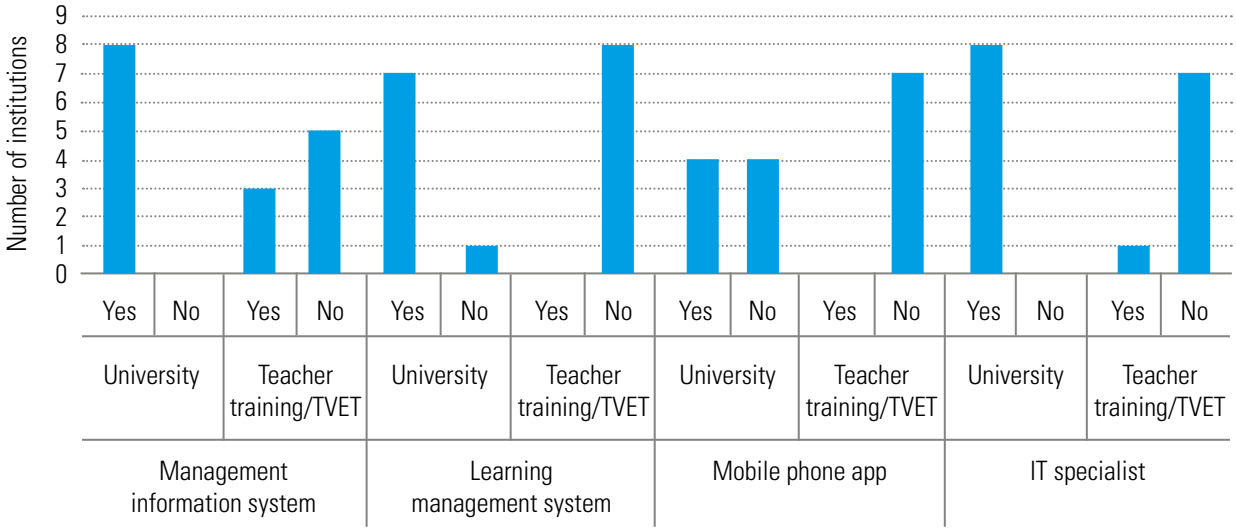
Source: 2018 World Bank Survey

Note: Enrollment data are the most recent available. Missing values are imputed based on 2017 ZIMCHE data.

FIGURE 32 STUDENT SATISFACTION WITH INTERNET CONNECTIVITY BY TYPE OF INSTITUTION, 2018

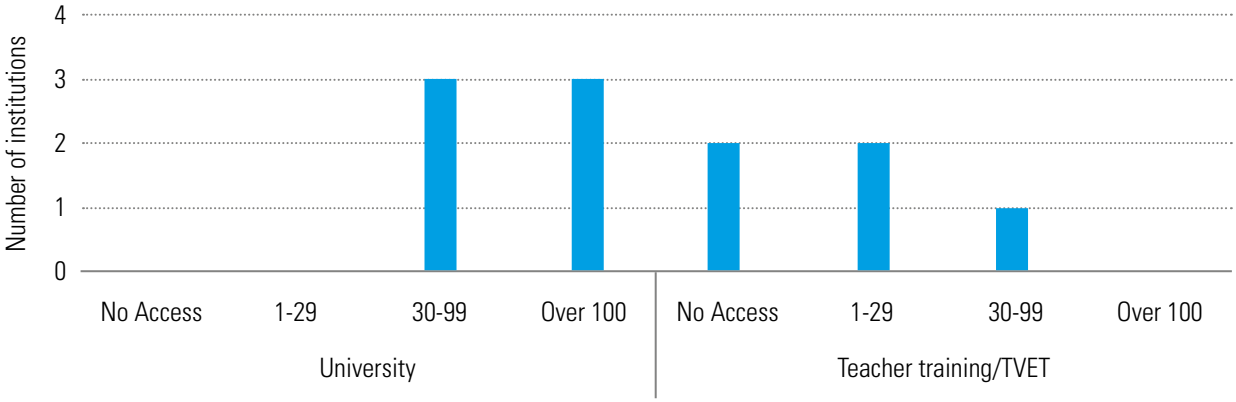
Source: 2018 World Bank Survey

FIGURE 33 ONLINE EDUCATION, MANAGEMENT, AND SUPPORT SYSTEMS BY TYPE OF INSTITUTION, 2018



Source: 2018 World Bank Survey

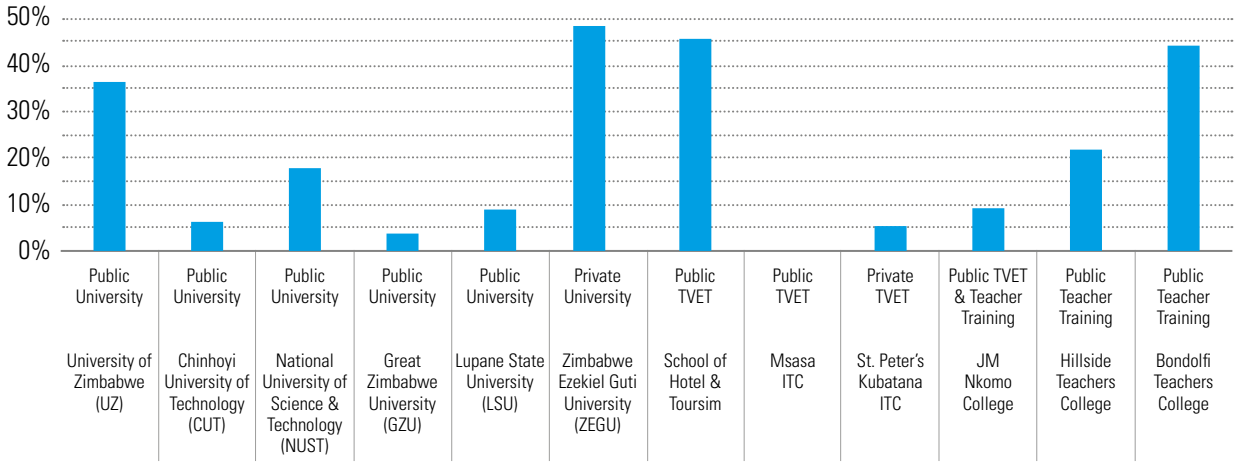
FIGURE 34 LIBRARY ACCESS TO ONLINE JOURNALS AND BOOK DATABASES BY TYPE OF INSTITUTION, 2018



Source: 2018 World Bank Survey

66. The capacity of student hostels is inadequate to meet the needs of the student population, especially among public universities. In the three public universities that responded to the questionnaire, the total capacity of student hostels equaled just 10 percent or less of total enrollment (Figure 33). The condition of student hotels is mixed, with the poorest conditions observed in older public universities with hostels constructed before 2000 (Figure 34). Hostel fees at universities range between US$200 and US$450 per semester, whereas hostel fees at TVET institutions and teacher training colleges are far less expensive at US$25 to US$40. Almost all the institutions that responded to the questionnaire are planning to build new hostels in the next five years using the build-operate-transfer (BOT) model.

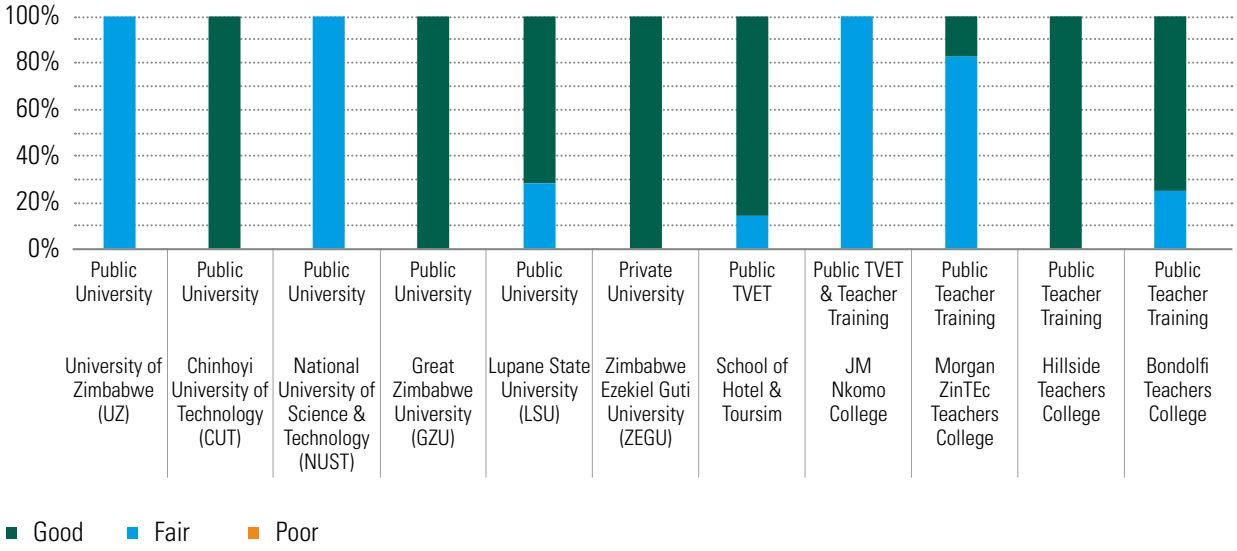
FIGURE 35 TOTAL CAPACITY OF STUDENT HOSTELS AS A SHARE OF TOTAL ENROLLMENT, 2018



Source: 2018 World Bank Survey and ZIMCHE

Notes: Student hostel data are the most recent available. Missing values are imputed based on 2017 ZIMCHE data.

FIGURE 36 THE CONDITION OF STUDENT HOSTELS BY INSTITUTION, 2018

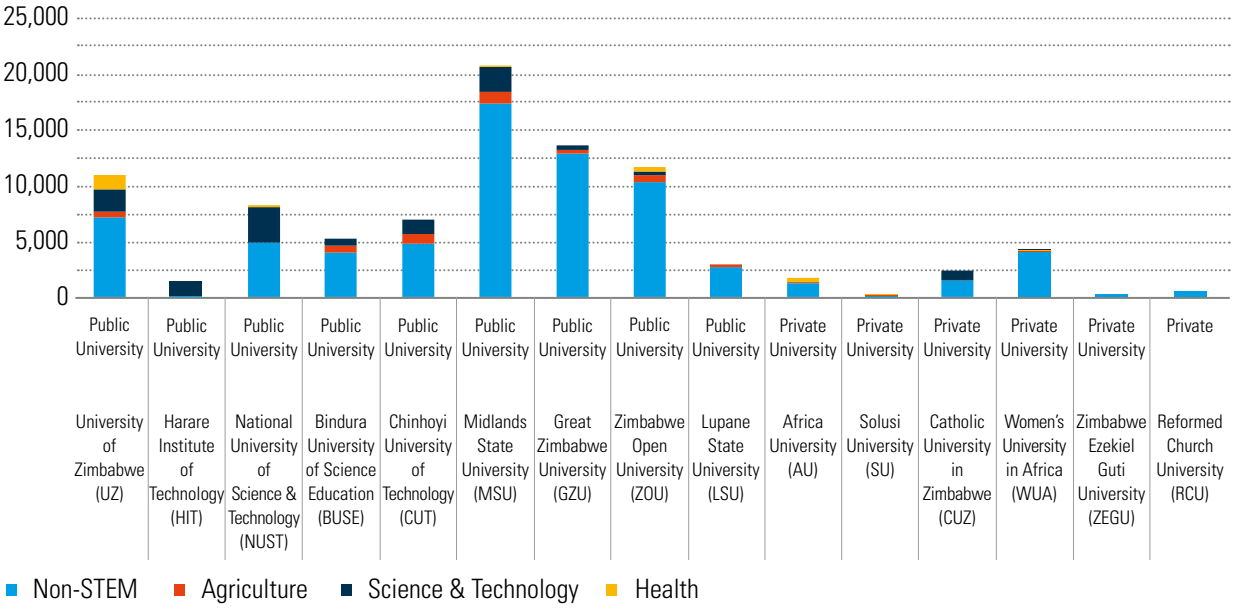


Source: 2018 World Bank Survey

Availability of STEM Programs

67. Only a small number of Zimbabwean universities offer STEM programs. The Harare Institute of Technology (HIT) and the National University of Science and Technology (NUST) are the main institutions that focus on STEM subjects. Together, HIT and NUST account for half of all university students studying science and technology (Figure 35). The two institutions offer not only engineering and technology programs but have also a wide range of information technology and computer science programs, including cyber-security. The University of Zimbabwe, also has STEM-related departments such as the Faculty of Engineering and the Faculty of Basic Sciences. It hosts the HCC super-computer developed and managed by the Ministry on behalf of all tertiary education institutions in the country.

FIGURE 37 UNIVERSITY ENROLLMENT BY DISCIPLINE, 2017



Source: ZIMCHE

Note: Health includes Medicine and Health Science. Agriculture includes Veterinary Science. Categorization of the discipline was done based on the names of the faculties.

68. In the absence of detailed labor market and technology transfer data, little information is available about the quality and relevance of existing STEM programs in Zimbabwe. However, the field visits have shown that the main bottlenecks in STEM universities and polytechnics are the lack of qualified academics and the difficulties in purchasing and maintaining state-of-the-art scientific equipment. Many universities have lost their most senior academics to institutions in neighboring countries, mainly Botswana, Namibia and South Africa. The polytechnics, in turn, see their lecturers move to universities as soon as they get their PhD. Another challenge faced by the STEM institutions is to be flexible enough to update the curriculum regularly and rapidly to keep up with global trends in the STEM areas. On the positive side, the top institutions have close linkages with industry and help their students get internships.

69. Studies on the digital transformation of the African economy stress the importance for Zimbabwe of further developing its STEM programs (World Bank, 2019). Mobilizing digital innovations to transform economies, societies and governments in Africa will require the following foundational pillars: (1) digital infrastructure, (2) digital entrepreneurship (3) digital platforms, (4) digital financial services, and (5) digital skills. Digital economies are energized when there is a sizeable population of the population with basic digital skills and a critical mass of tech-savvy skilled personnel and advanced specialists that help to adapt and diffuse digital technologies across different sectors. Therefore, the Zimbabwean economies require both a *digitally competent workforce and digitally literate citizens* who could reap the benefits that the digital transformation can bring.

Research and Innovation

University Research Output

70. The aggregate research output of a country's universities provides another measure of the economic impact of its tertiary education sector. The number of citable documents per capita reflects the quantitative dimension of research production, while the country's H-index[21] measures the quality and influence of its research output (Table 5).

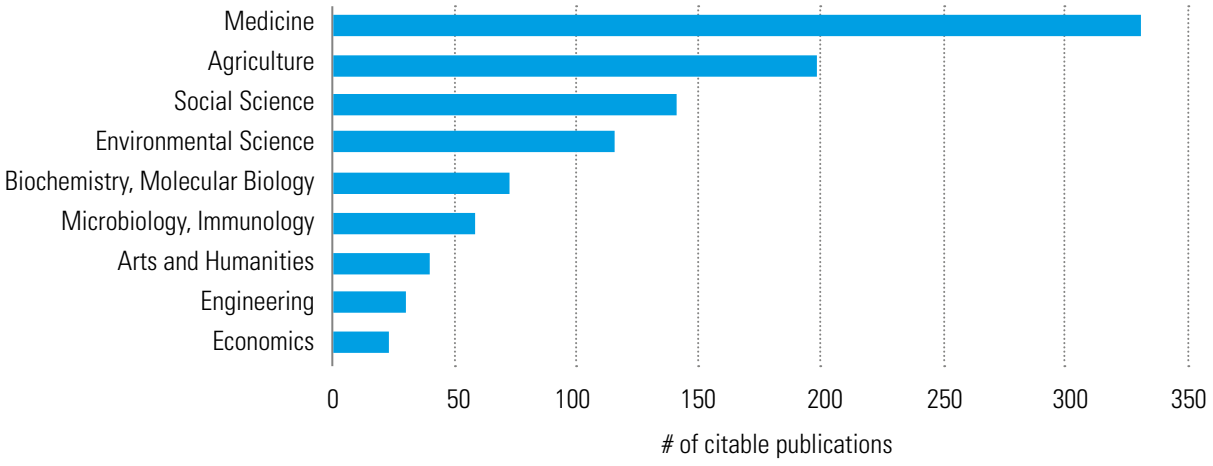
TABLE 8 RESEARCH OUTPUT, ZIMBABWE AND COMPARATOR COUNTRIES, 2010 AND 2018

Country	Citable Documents per Million Inhabitants (2010)	Citable Documents per Million Inhabitants (2018)	H-Index (2018)
Ethiopia	9.2	181.6	125
Ghana	30.4	516.4	129
Kenya	36.3	565.1	216
Nigeria	31.6	366.2	166
Rwanda	12.8	173.9	70
Senegal	29.8	546.9	111
South Africa	229.2	4,233.5	391
Tanzania	17.8	248.3	145
Uganda	25.6	323.3	156
Zimbabwe	**24.6**	**561.2**	**119**

Source: SCImago. SJR — SCImago Journal & Country Rank. https://www.scimagojr.com

71. Zimbabwean publications are concentrated in scientific disciplines such as medicine, agricultural science, environmental science, and microbiology. Zimbabwe's main research areas are similar to those of other African countries, which tend to focus on biology, agriculture, and environmental sciences. Medical research is a frequent subject of international collaboration in Zimbabwe. Social sciences, including economics, are also a frequent research subject, and the arts and humanities play a smaller but still significant role in Zimbabwean research (Figure 36).

FIGURE 38 CITABLE PUBLICATIONS PRODUCED IN ZIMBABWE BY DISCIPLINE

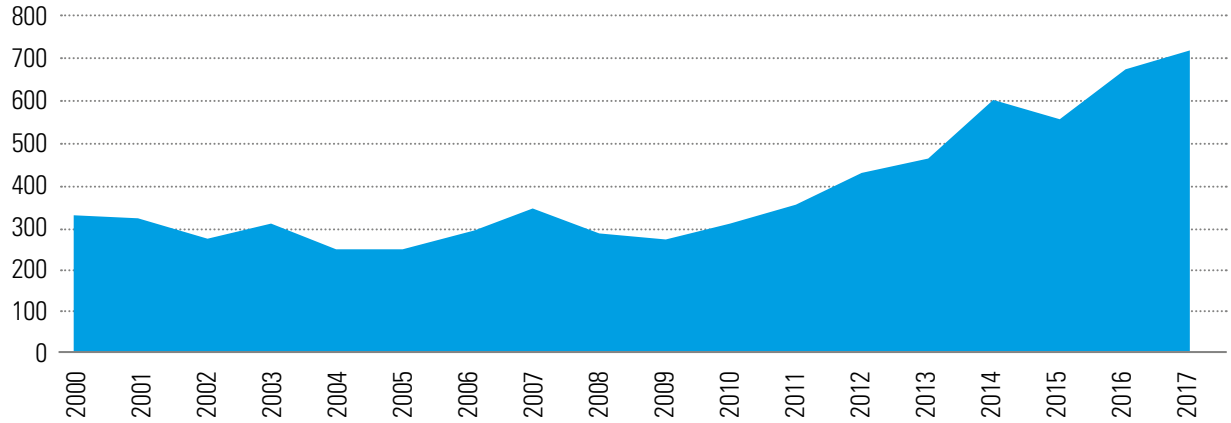


Source: Scimago Journal and Country Rank

72. In spite of the economic crisis, Zimbabwe has managed to maintain a relatively high level of quantitative research output. Among Sub-Saharan African countries, Zimbabwean researchers published the third-highest number of research papers per capita, after South Africa and Kenya, and Zimbabwe's total volume of academic publications has steadily increased. The number of citable publications by Zimbabwean researchers more than doubled from 329 in 2000 to 719 in 2017 (Figure 37). These publications include

articles, reviews, and conference papers. This increase in citable publications is a remarkable achievement considering the country's deeply adverse socioeconomic environment during much of the period.

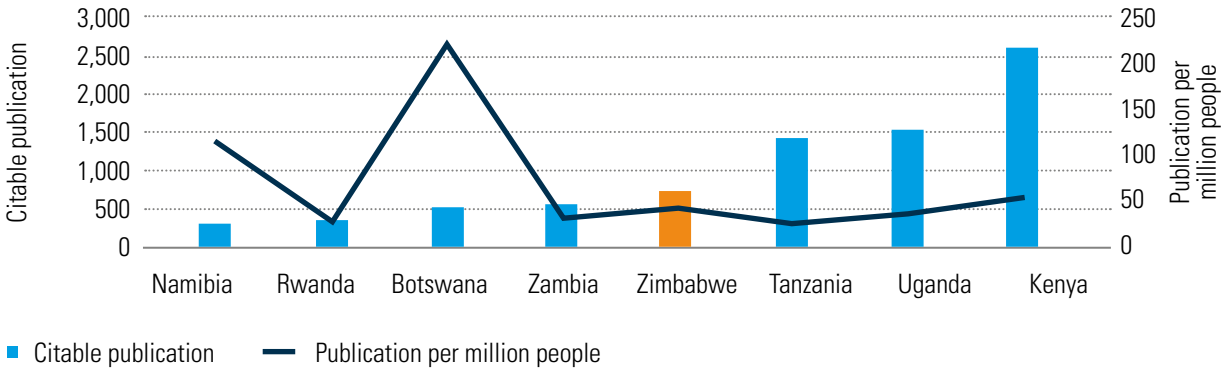
FIGURE 39 NUMBER OF CITABLE PUBLICATIONS BY ZIMBABWEAN RESEARCHERS, 2000-2017



Source: Scimago Journal and Country Rank

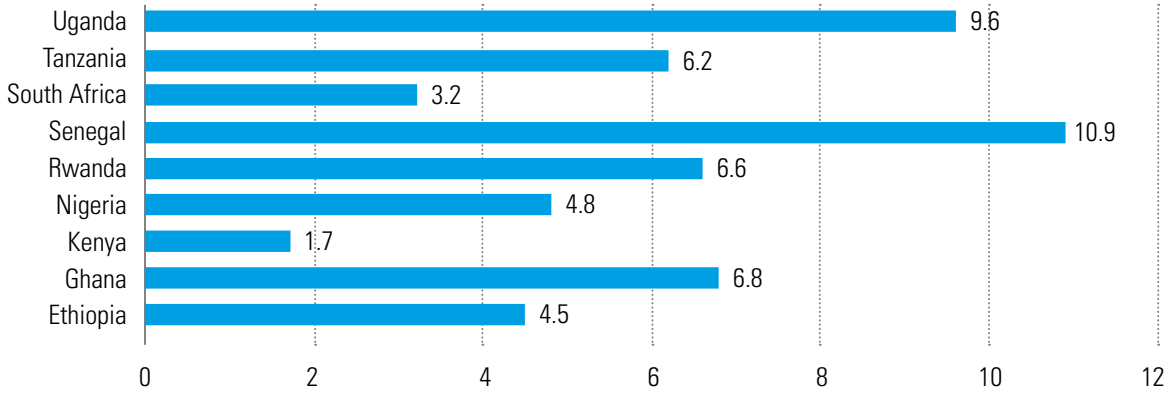
73. Zimbabwe outperforms most of its Southern African peers in total publications, and it matches comparable East African countries in publications per capita. Despite the country's deteriorating research environment, Zimbabwe has continued to produce more citable publications than other Southern African countries, with the exception of South Africa, which produced more than 20,000 citable publications in 2017 alone. Zimbabwe produces fewer total publications than do its East African peers, but it produces a comparable number of citable publications on a per capita basis. In 2017, Zimbabwe produced 43 citable publications per million people, slightly below the level of Kenya (52) but significantly higher than that of Tanzania (25). Conversely, Botswana and Namibia produce fewer total citable publications than does Zimbabwe, yet they both produce more on a per capita basis (Figure 38). Zimbabwe also performs well in terms of research output relative to GDP (Figure 39).

FIGURE 40 NUMBER OF CITABLE PUBLICATIONS PRODUCED EACH YEAR, ZIMBABWE AND COMPARATORS, 2017



Source: Scimago Journal and Country Rank for citable publications; World Bank for population sizes

FIGURE 41 NUMBER OF SCHOLARLY JOURNAL ARTICLES PER US$ BILLION, IN GDP, ZIMBABWE AND COMPARATOR COUNTRIES, 2018



Source: Global Innovation Index https://www.globalinnovationindex.org/gii-2018-report

Note: GDP figures are expressed in purchasing-power-parity terms

74. The scientific journal *Nature* has developed a new measure of progress in scholarly output, which underscores the challenges faced by Zimbabwe.[22] The Nature Index focuses on "rising stars," which are institutions that have rapidly increased their contribution to a selection of top natural science journals. The 2016 Nature Index tracked the research output of over 8,000 global institutions between 2012 and 2015. Of the 25 "rising stars" in Africa, 15 were in South Africa, four were in Morocco, two were in Tunisia, and Algeria, Burkina Faso, Kenya and Senegal had one each. However, no Zimbabwean research institution had produced a sufficient volume of high-quality research to be included in the list (Table 6).

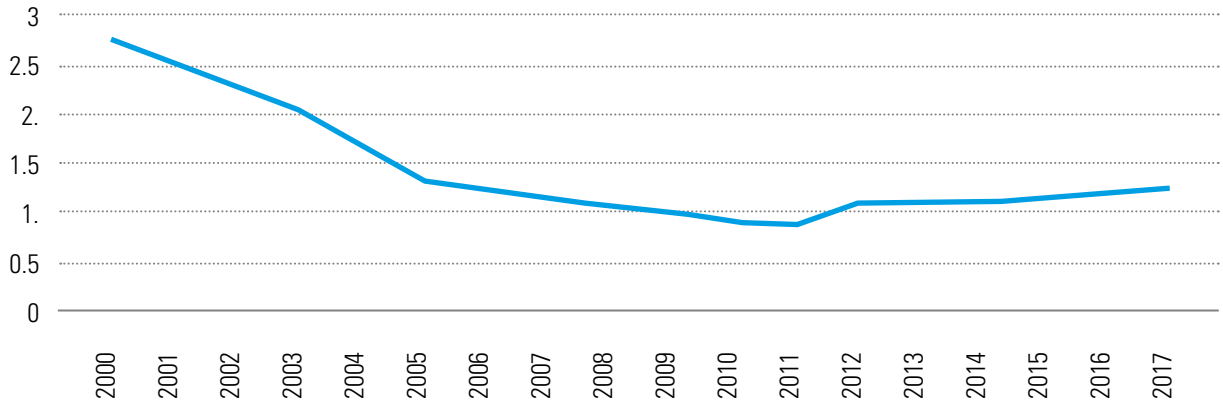
TABLE 9 THE NATURE INDEX'S 25 "RISING STARS" IN AFRICAN RESEARCH, 2016

Country	Number of "Rising Star" Institutions	Rank of the Top Institution
South Africa	15	1
Senegal	1	10
Morocco	4	11
Burkina Faso	1	15
Tunisia	2	16
Kenya	1	19
Algeria	1	23

Source: Nature (2016)[23]

75. The rapid growth of research output in other African countries is diminishing Zimbabwe's status as a regional leader. Although Zimbabwean researchers have increased their total number of citable publications, research output has grown faster in other African countries. For example, between 2000 and 2017, the total number of citable publications produced each year rose from 78 to 555 in Zambia, from 256 to 1,414 in Tanzania, and from 609 to 2,609 in Kenya, eroding Zimbabwe's competitive advantage in academic research. The share of Zimbabwe's citable publications in all citable publications produced in Africa dropped from 2.75 percent in 2000 to 0.88 percent in 2011, then rose slightly to 1.25 in 2017 (Figure 40).

FIGURE 42 ZIMBABWE'S SHARE OF THE CITABLE PUBLICATIONS PRODUCED IN AFRICA, 2000-2017



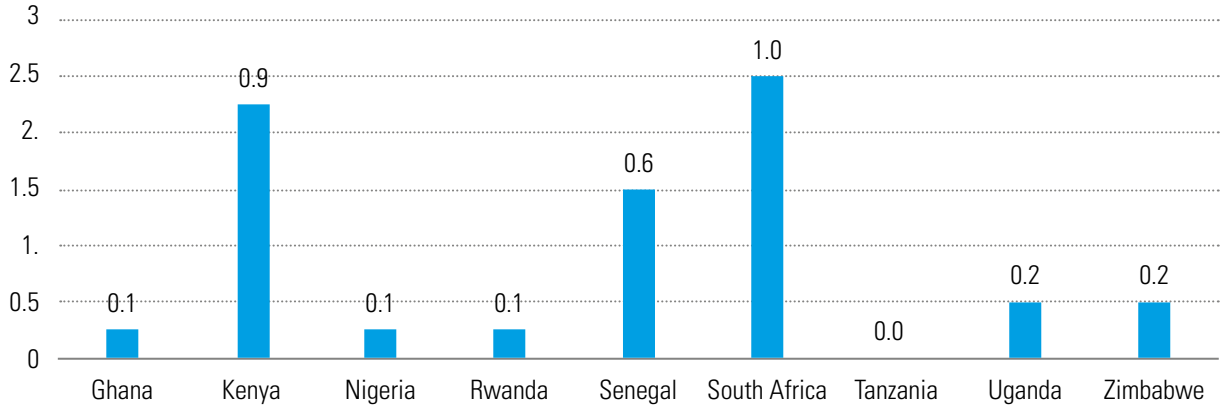
Source: Scimago Journal and Country Rank

76. Moreover, the volume of Zimbabwe's research output belies the limited quality and impact of its scholarly publications. Zimbabwe's H-Index score is lower than those of most comparator countries (Table 5, above). In Clarivate Analytics' list of highly cited scientists during the 2005-2015 period, no Zimbabwean institution hosts a top-level researcher.[24] By contrast, South African institutions host three of the list's 3,500 highly cited scientists. Chinese institutions host 218, up from just two in 2001.

Innovation and Technology Transfer

77. Zimbabwe also underperforms on measures of innovation and technology transfer compared to its peers. The number of patents registered in a given country each year is a proxy of its capacity to produce new innovations or adapt existing technologies for local use. Zimbabwe registers few patents relative to its GDP (Figure 41), which may indicate that research institutions are making a limited contribution to the country's economic recovery.

FIGURE 43 NUMBER OF PATENTS RELATIVE TO GDP, ZIMBABWE AND COMPARATOR COUNTRIES, 2018

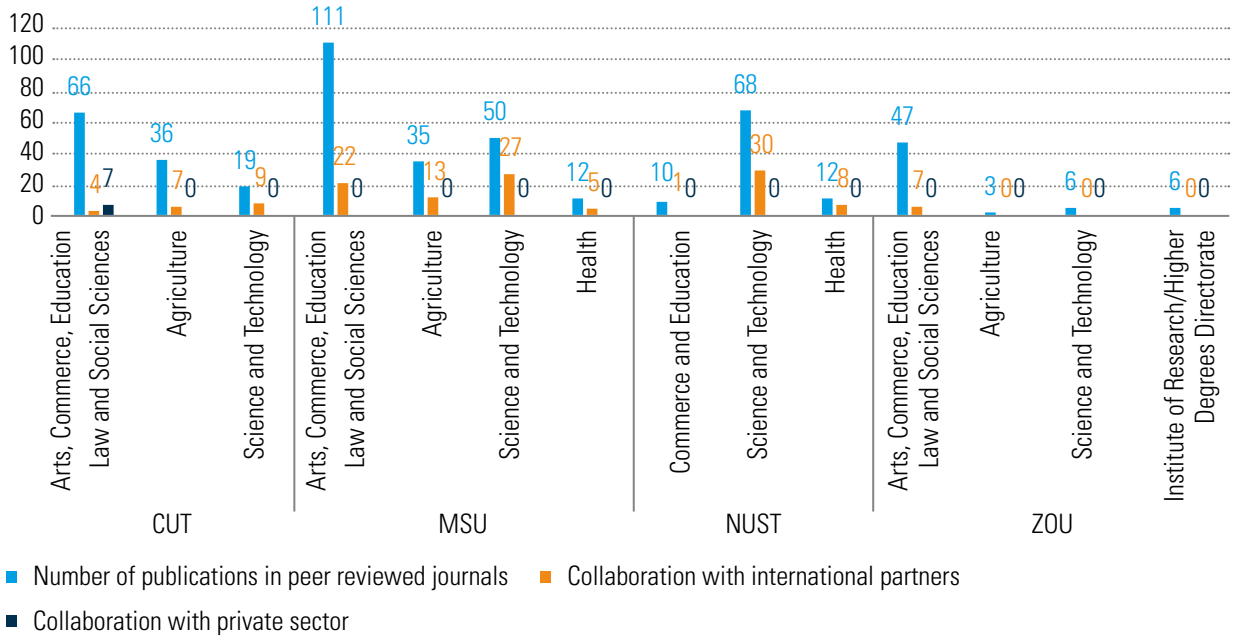


Source: Global Innovation Index https://www.globalinnovationindex.org/gii-2018-report

International Collaboration

78. Across institutions, collaborative research with international partners is most common in STEM departments. In the four public universities that provided data on research projects, most output was published in international peer-reviewed journals. Academic staff in the science and technology departments produced a large share of all research publications (Figure 42), often in collaboration with international counterparts and with support from international research grants. By contrast, researchers in the humanities and social sciences had significantly less access to international collaboration and grant support. Collaborative research with the private sector appears to be rare, even in major public universities, and the three public universities that responded to the questionnaire reported undertaking no collaborative research with the private sector. Limited collaboration with the private sector may negatively affect the market relevance of university programs.

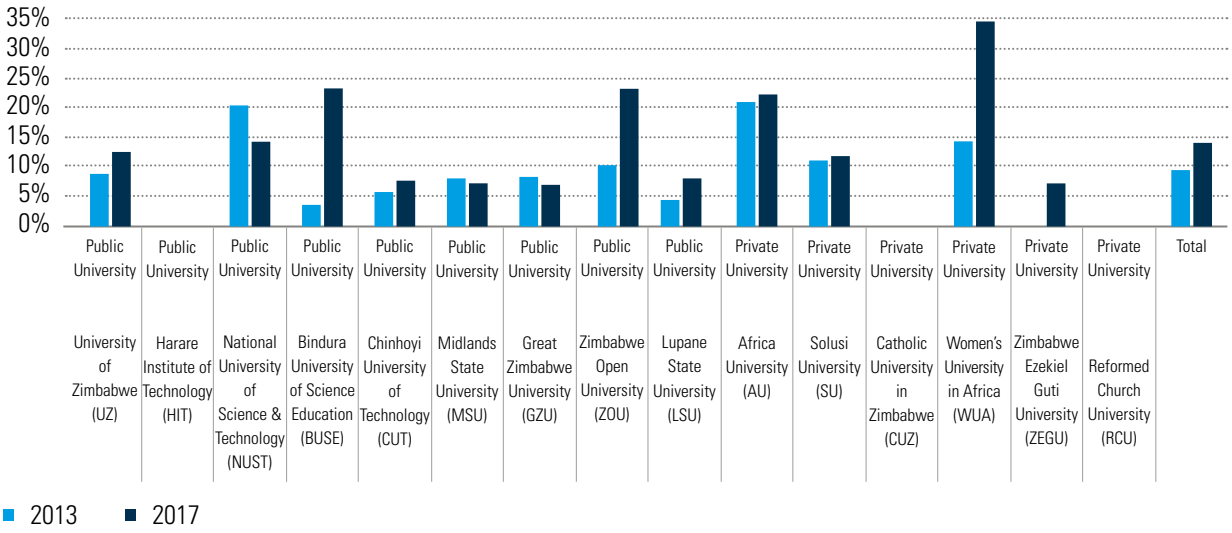
FIGURE 44 NUMBER OF PUBLICATIONS PRODUCED BY FOUR PUBLIC UNIVERSITIES BY ACADEMIC DEPARTMENT, 2017



Source: 2018 World Bank Survey

79. In recent years, the share of postgraduate students has significantly increased at many public universities. The upward trend in the share of postgraduate students has been also observed among private universities (Figure 43). The rising trend in public universities has been driven by an increasing number of postgraduate students in the humanities and social sciences, which significantly exceeds the number of postgraduate STEM students.

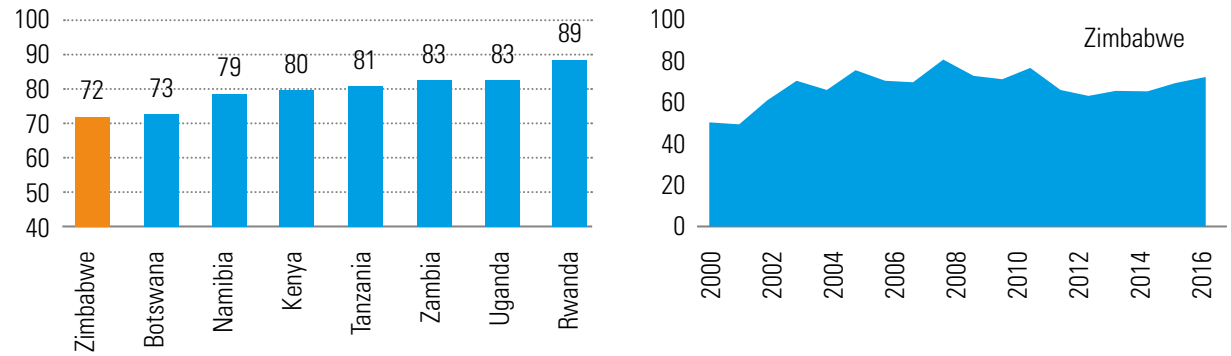
FIGURE 45 SHARE OF POSTGRADUATE STUDENTS IN PUBLIC AND PRIVATE UNIVERSITIES, 2013 AND 2017



Source: ZIMCHE

80. While a large share of Zimbabwean research involves international collaboration, the frequency of international research collaborations is lower in Zimbabwe than in other countries in the region. In 2017, more than 70 percent of Zimbabwe's citable publications were published in collaboration with international researchers and support from external research funding (Figure 44). This reliance on international collaboration affords foreign researchers significant influence over Zimbabwe's research agenda, but this phenomenon is not unique to Zimbabwe. Indeed, many other countries in the region rely more heavily on external research funding and international collaboration. For example, 83 percent of Zambia's citable publications are the product of international collaboration. The share of international collaboration in Zimbabwe's total research output has not increased over the past decade, likely due to the economic turmoil that characterized much of the period and the international sanctions imposed on the country. International collaboration can greatly increase research output, encourage the adoption of new methodologies, and offer valuable insights. Zimbabwe's relatively modest engagement in international research collaboration may diminish the country's scholarly output.

FIGURE 46 SHARE OF PUBLICATIONS PRODUCED THROUGH INTERNATIONAL COLLABORATION, ZIMBABWE AND COMPARATOR COUNTRIES (%)



Source: Scimago Journal and Country Rank

Sectoral Governance

81. Zimbabwe's tertiary education sector suffered from a lack of strategic direction during the economic crisis, and the authorities did not prepare a plan for the sector for over a decade. However, the MHTESTD has adopted a highly proactive approach to strategic planning, and over the past year it has conducted a skills audit, developed the New Higher Education Strategy, and updated the qualifications framework. The ZIMCHE supports the MHTESTD. Its primary mandate is quality assurance and enhancement, and it is in charge of institutional registration, accreditation, audits, and the assessment of foreign qualifications.

82. Zimbabwe's tertiary education sector suffers from multiple organizational and institutional weaknesses. First, the education authorities distinguish between "higher education", which includes universities and polytechnics, and "tertiary education" consisting of post-secondary colleges, some of which do not offer degrees. This distinction is not common in other countries; its purpose is unclear; and Zimbabwe's articulation policies (or lack thereof) inhibit the movement of students between the two subsystems. Second, the country lacks a comprehensive information-management system, which constrains performance monitoring and weakens the foundation for evidence-based policymaking. Third, the ZIMCHE's funding model relies on a tax imposed on each university based on their enrollment, creating a strong disincentive to report enrollment figures accurately. Fourth, salaries for staff at teacher training colleges and TVET institutions are significantly lower than salaries for university staff, which makes it totally unattractive to teach in non-university institutions. The result is that all qualified academics gravitate towards the universities, which means that the colleges get their academics by default rather than by vocation.

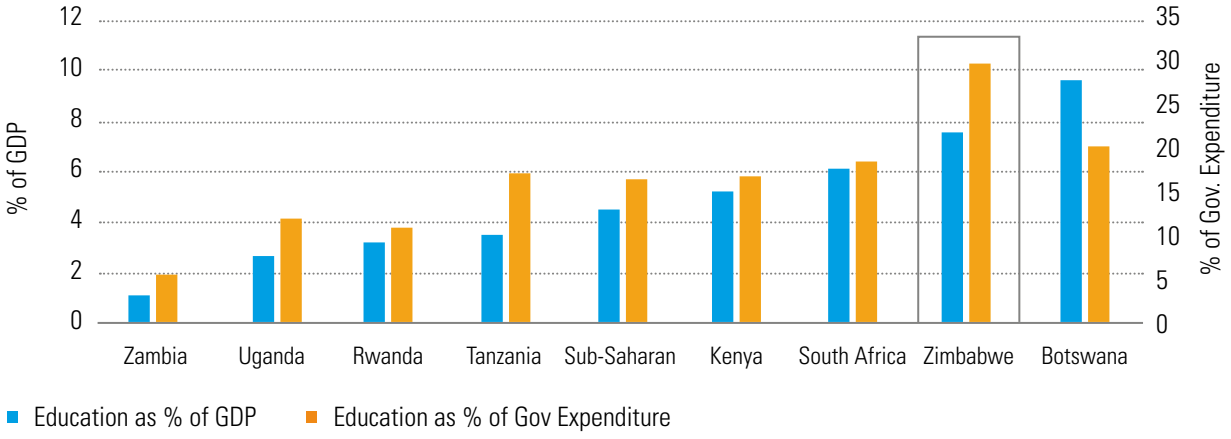
83. At the institutional level, Zimbabwe's public universities are not fully autonomous, especially in terms of financial and human-resources management. The MHTESTD controls the budgetary and tuition policies of public universities. Even when faced with severe financial limitations, these universities are not allowed to strictly enforce their tuition requirements. Moreover, public universities are overseen by very large councils, usually between 30 and 45 members, who receive financial allowances paid by the universities. This system increases the cost and limits the quality and effectiveness of university governance.

Sectoral Financing

Resource Mobilization

84. Zimbabwe maintains high levels of public education spending, including spending on tertiary education, relative to the size of its economy. The Zimbabwean government consistently invests over 7 percent of GDP in education, well above the average for Sub-Saharan Africa and one of the largest shares in the region. The government's longstanding commitment to education spending reflects the importance of human-capital development as a national cultural value. Education represented 30 percent of total public spending in 2014, among the highest levels in Africa and far above the Sub-Saharan Africa average of 19 percent. Tertiary education accounted for 17 percent of public education spending in 2014, below the Sub-Saharan Africa average of 20 percent, but a large share relative to total public spending (Figure 45). However, the extent to which Zimbabwe's high levels of education spending are impacting economic productivity and workforce skills development remains unclear.

FIGURE 47 PUBLIC SPENDING ON EDUCATION AS A SHARE OF GDP AND TOTAL PUBLIC SPENDING, ZIMBABWE AND COMPARATOR COUNTRIES (%)

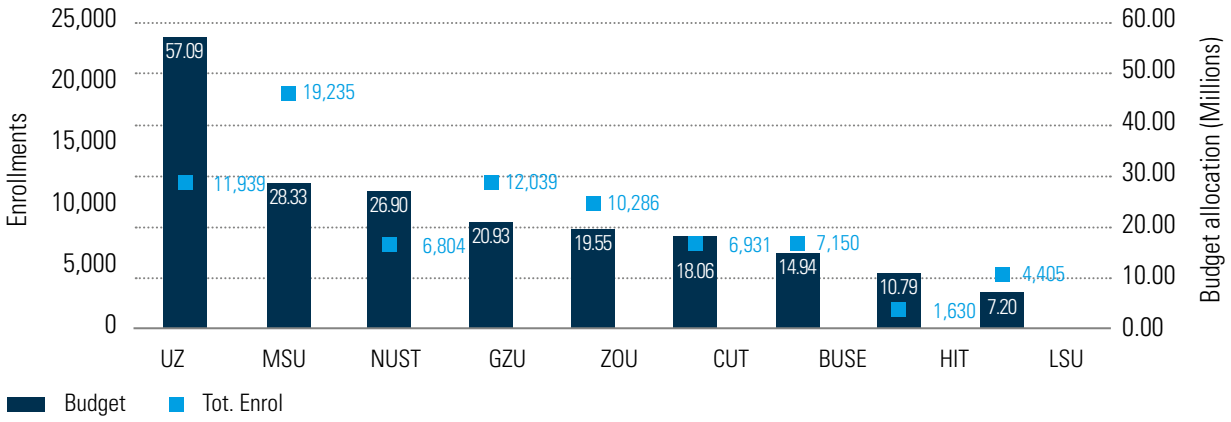


Source: World Bank, Data Bank – Education Statistics, retrieved on March 25, 2019

Note: The latest available figures for each country

85. Over the past decade, Zimbabwe's economic crisis has deprived the tertiary education sector of much-needed funding. In addition, budget allocations are not closely correlated with enrollment (Figure 46). Other criteria—such as the age of the institution—influence the distribution of resources, meaning that the oldest-established universities receive more resources on a per-student basis than the younger ones, in the absence of an objective and transparent funding formula. Insufficient financial resources have limited education access, reduced the equity of access to education services, eroded the quality of teaching and the learning environment, constrained budgets for research, scholarships, and training, and weakened strategic planning.

FIGURE 48 BUDGET ALLOCATIONS AND TOTAL ENROLLMENT AMONG PUBLIC UNIVERSITIES, 2015

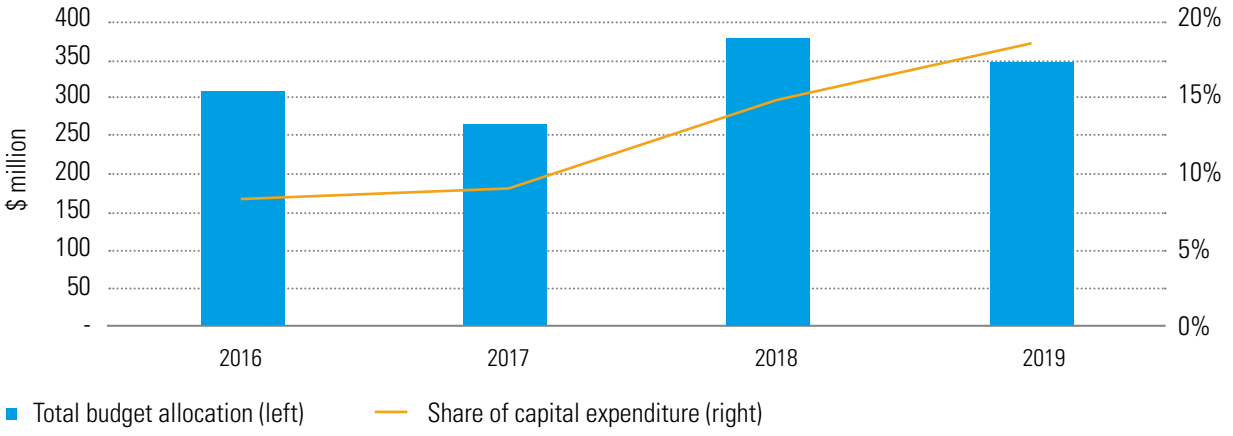


Source: MHTESTD

86. The MHTESTD budget has fluctuated substantially from year to year. The government typically allocates US$300-350 million to the MHTESTD.[25] The size of the MHTESTD budget does not appear to follow a consistent pattern, but instead reflects annual changes in the government's overall fiscal position. The share of the MHTESTD budget devoted to capital investment rose to 15

percent in 2018 and is expected to increase further in 2019 (Figure 47). A continued increase in capital investment will be vital to expand institutions and meet the surging demand for tertiary education.

FIGURE 49 TOTAL MHTESTD BUDGET AND SHARE ALLOCATED TO CAPITAL INVESTMENT



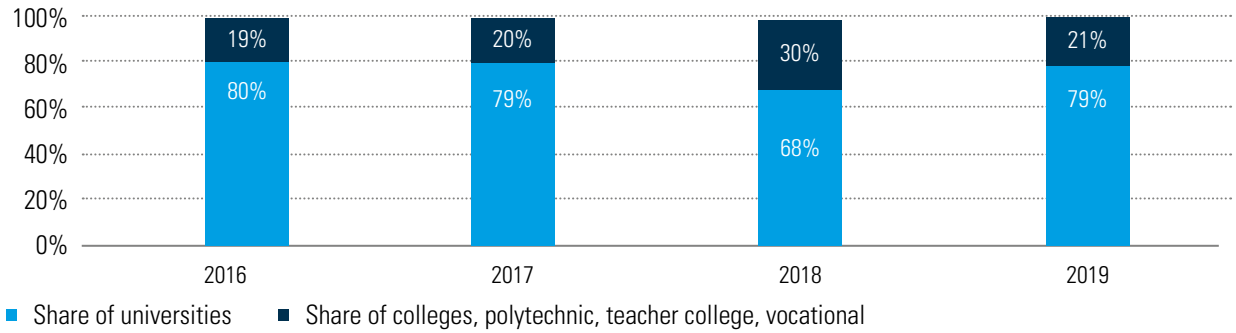
Source: Budget Blue Book, respective year, including both current and capital budgets

Note: 2016 and 2017 figures are based on revised estimates, 2018 figures are based on appropriations, and 2019 figures are based on indicative appropriation estimates

Resource Allocation

87. History-based budgeting drives the allocation of funding to Zimbabwe's tertiary education sector. History-based budgeting, in which allocations in previous years are used as benchmarks to determine allocations in subsequent years, is the most common approach to recurrent budget allocation in Africa.[26] Year-to-year changes in sectoral budgets reflect changes in the government's overall fiscal stance. Consequently, Zimbabwe's tertiary education budget is unpredictable, and budget allocations do little to incentivize institutional performance. 88. Universities receive the largest share of the tertiary education budget. Around 80 percent of the MHTESTD's budget typically goes to universities, while teacher training colleges, polytechnics, and other TVET institutions receive the remaining 20 percent (Figure 48). This allocation pattern has remained broadly stable over time. This budgetary allocation in favor of universities contributes to the financing constraints faced by the country's non-university tertiary education institutions. As of 2017, there were around 92,000 students in universities while a total of 52,000 students were enrolled in TVET and teacher training institutions.

FIGURE 50 ALLOCATION OF THE TERTIARY EDUCATION BUDGET BY TYPE OF INSTITUTION, 2016

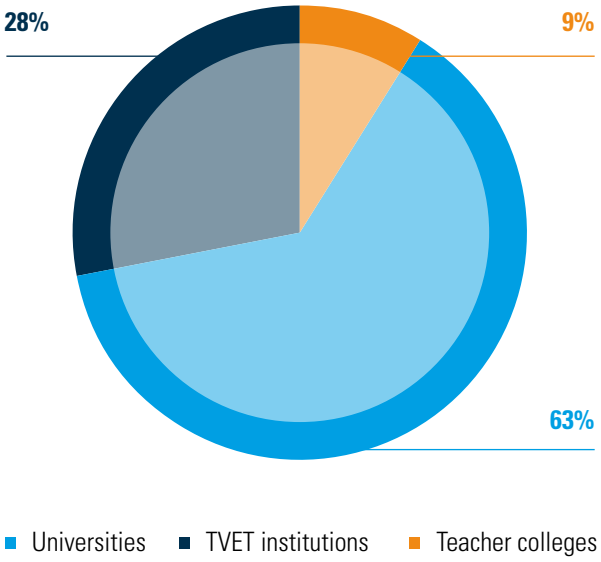


Source: Budget Blue Book, respective year, including both current and capital budgets

Note: 2016 and 2017 data are based on revised estimate, 2018 data on appropriation, and 2019 data on indicative appropriation estimate.

89. The distribution of public investments between universities and other tertiary institutions is marginally more equal. In 2016, universities accounted for 60 percent of the MHTESTD investment budget. TVET institutions, which received less than 20 percent of the total MHTESTD budget, accounted for around 28 percent of the capital budget (Figure 49).

FIGURE 51 ALLOCATION OF THE TERTIARY EDUCATION INVESTMENT BUDGET BY TYPE OF INSTITUTION, 2016

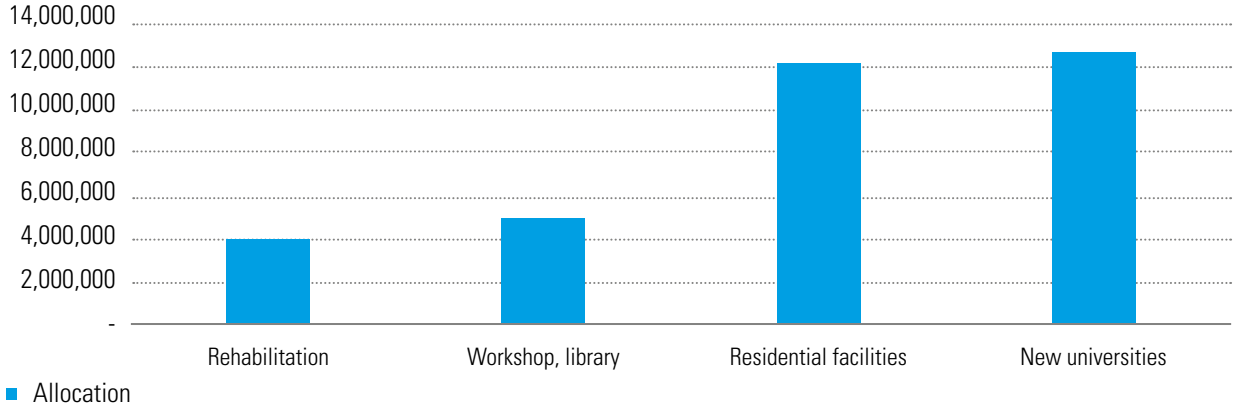


Source: Budget Blue Book 2016, revised estimates

90. However, the government budget may not accurately reflect public capital investment in universities. For example, the relatively large share of investment in the TVET subsector is driven by appropriations under so-called "retention funds" or "statutory funds," which are own-source revenues collected by public agencies outside of the regular budget. Statutory funds or retention funds for TVET institutions are captured in the budget, but universities are treated as autonomous entities, and their own-source revenues are not included in the budget. Moreover, donor-funded investment projects may also be excluded from the budget. Combined, these factors lead to the significant underreporting of university investment. For example, the two most popular universities in Harare, the UZ and HIT, received just US$500,000 and US$200,000, respectively, in capital-budget transfers—allocations that are unlikely to reflect their actual levels of capital investment.

91. University investments funded via the capital budget focused on the construction of new universities and housing facilities at existing institutions. The list of investment projects funded through the 2018 capital budget include the construction of new universities, residential facilities for students and staffs, and engineering workshops and libraries, as well as the rehabilitation of buildings and infrastructure (Figure 50). In 2018, more than US$12.6 million (37 percent of the capital budget for education) supported construction works for new universities, including Marondera University of Agricultural Sciences and Technology and Manicaland University of Applied Sciences. Over US$12.1 million (36 percent of the budget) financed the construction of new residential facilities for students and staff, yet interviews with university management suggest that there is significant unmet demand for residential facilities. The MHTESTD has launched PPP initiatives to support the construction of new residential facilities.

FIGURE 52 ALLOCATION OF CAPITAL TRANSFERS TO UNIVERSITIES BY INVESTMENT PURPOSE, 2018 (US$)

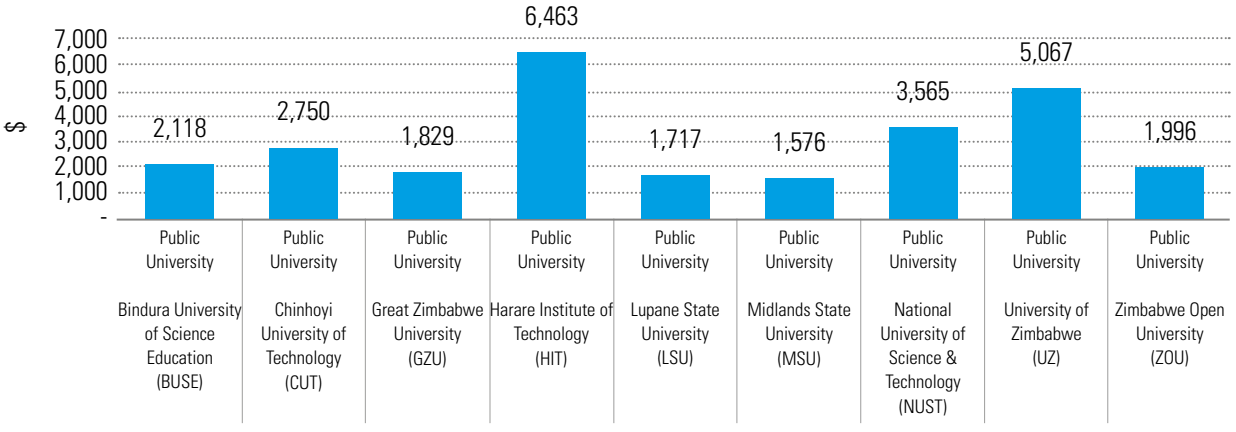


Source: Budget Blue Book, 2018

Unit Costs and Revenues at the Institutional Level

92. Current spending per student varies considerably between public universities. As noted above, budget allocations to tertiary education institutions are not based on an objective and transparent funding formula that would reflect enrollment numbers, actual cost of programs and their scientific infrastructure, staff headcounts, or institutional performance. As a result, per-student budget allocations vary widely. Among the nine public universities that are currently in operation, HIT receives the largest amount of recurrent transfers per student at US$6,400, followed by UZ at US$5,000. NUST also receives a substantial amount in current transfers, and overall, STEM-oriented institutions and Harare-based universities tend to receive the largest amounts per student (Figure 51). However substantial disparities exist even among these institutions, as evidenced by the fact that the per-student allocation of Harare Institute of Technology is twice as high as that of National University of Science and Technology.

FIGURE 53 RECURRENT BUDGET ALLOCATION PER STUDENT BY UNIVERSITY, 2016

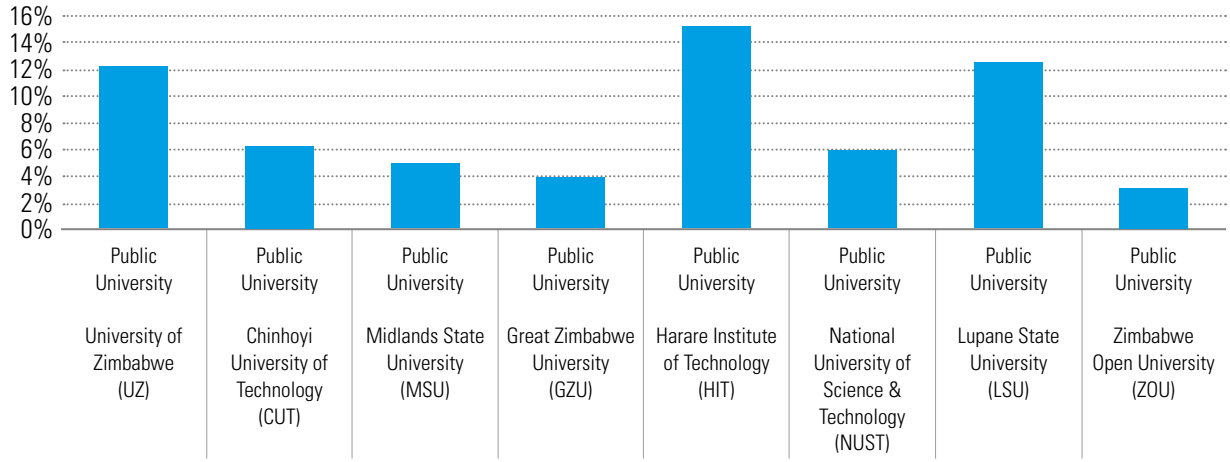


Source: Budget-allocation information comes from the 2016 Budget Blue Book, revised estimates; student enrollment information comes from ZIMCHE's consolidated enrollment figures for 2015

Own-Source Revenue Generation by Universities

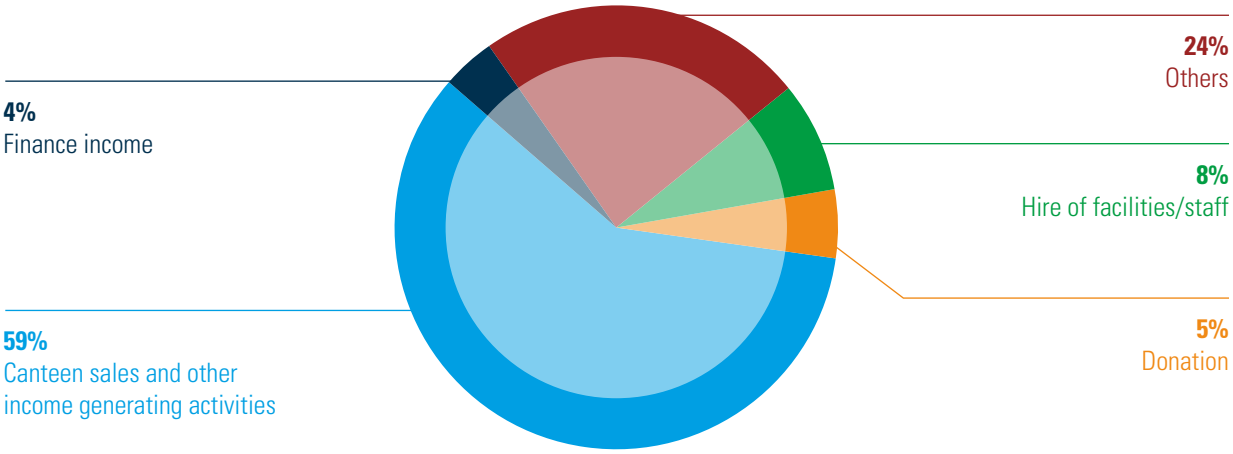
93. The universities that responded to the questionnaire indicated that own-source revenues account for between 4 and 15 percent of their total income. HIT reported receiving the largest share of own-source revenue relative to total revenue (Figure 52). However, very few institutions provided a detailed breakdown of their revenue streams. According to the information received from the country's largest university, MSU, 60 percent of its own-source revenue derived from sales in university canteens and other income-generating activities (Figure 53).

FIGURE 54 OWN-SOURCE REVENUE AS A SHARE OF TOTAL REVENUE AMONG PUBLIC UNIVERSITIES, 2018



Source: 2018 World Bank Survey

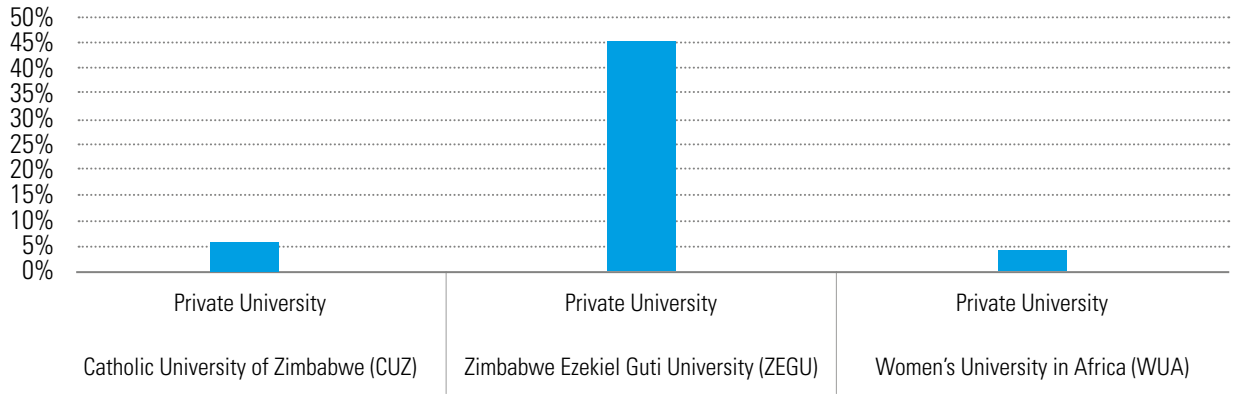
FIGURE 55 BREAKDOWN OF OWN-SOURCE REVENUE STREAMS AT MIDLANDS STATE UNIVERSITY, 2018



Source: 2018 World Bank Survey

94. Private universities depend primarily on tuition and endowment revenue. Three of the private universities that responded to the questionnaire provided their detailed financial information. Zimbabwe Ezekiel Guti University (ZEGU), one of Zimbabwe's smallest private universities, receives 45 percent of its budget from its institutional endowment, which is quite remarkable. Its tuition fees vary from US$550 (arts program) to US$849 (law program) per semester. By contrast, at Women's University in Africa (WUA), one of Zimbabwe's largest private universities, tuition fees account for 96 percent of total revenue (Figure 54). WUA's tuition fees for undergraduate, masters, and doctoral programs are US$883, US$1,100, US$1,250 per semester, respectively.

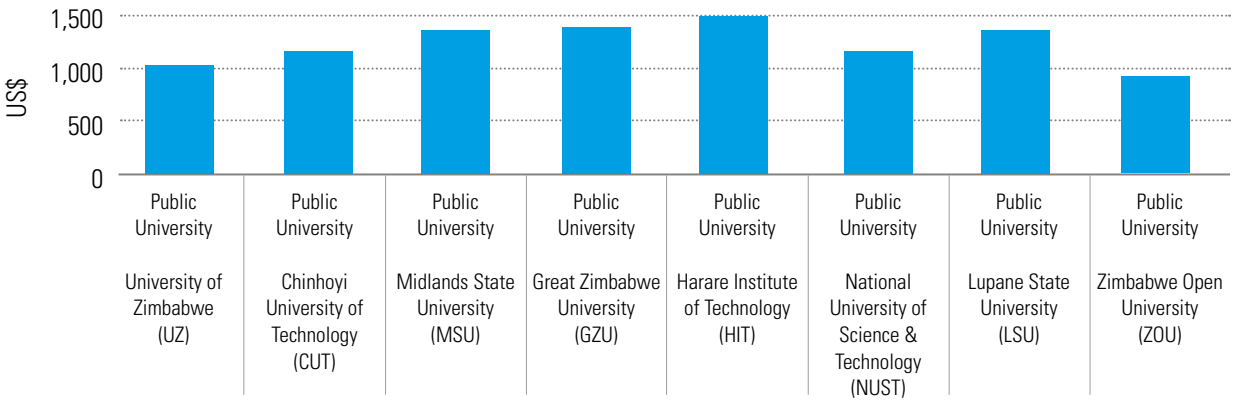
FIGURE 56 NON-TUITION INCOME AS A SHARE OF TOTAL INCOME AT THREE PRIVATE UNIVERSITIES, 2018



Source: 2018 World Bank Survey

95. Public universities also collect considerable income from tuition fees. Public transfers alone are insufficient to finance the operations of Zimbabwean universities. Public university tuition fees average US$1,000 to US$1,500 per student (Figure 55).

FIGURE 57 ANNUAL TUITION REVENUE PER STUDENT AMONG PUBLIC UNIVERSITIES, 2018

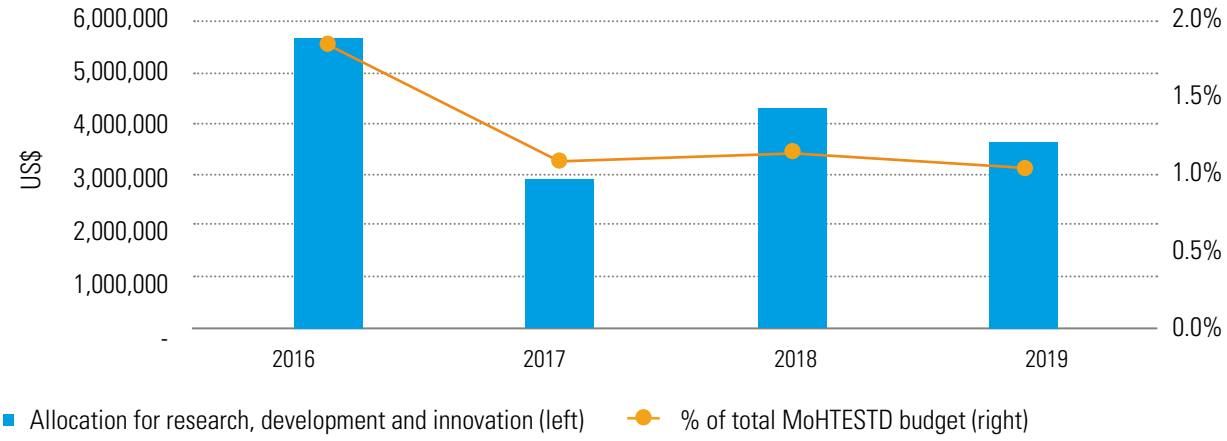


Source: 2018 World Bank Survey

Note: The amount of annual income from tuition fees in 2018 was divided by the total enrollment of each corresponding institution in the most recent year for which data is available.

96. Zimbabwean universities raise substantial amounts of research funding from external sources, but domestic funding levels are low. Public funding for academic research and development averages about US$3-4 million per year, or roughly 1 percent of the MHTESTD budget (Figure 56), a very modest amount for a country with an annual GDP of US$17.8 billion. Science and technology departments typically receive the largest amounts of research funding. Among the three public universities that provided information on research funding, UZ attracted both the greatest amount of total funding (US$1.2 million) and the largest share of domestic funding. MSU received more funding from international sources, but its total funding was lower (US$660,000). Meanwhile, NUST raised significantly less (US$380,000), and almost all of its research funding came from international sources (Figure 57).

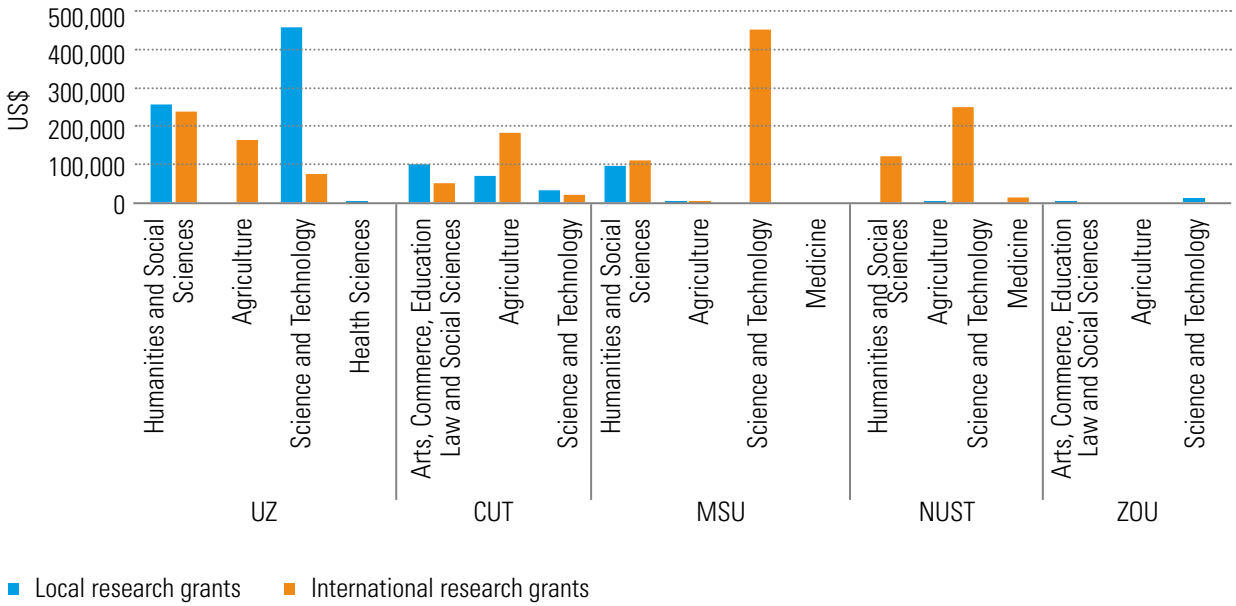
FIGURE 58 PUBLIC FUNDING FOR RESEARCH, DEVELOPMENT AND INNOVATION, 2016-19



Source: Budget Blue Book, respective year

Note: 2016 and 2017 data are based on revised estimate, 2018 data on appropriation, and 2019 data on indicative appropriation estimate.

FIGURE 59 ANNUAL RESEARCH FUNDING FROM LOCAL AND EXTERNAL SOURCES AMONG FOUR PUBLIC UNIVERSITIES, 2017

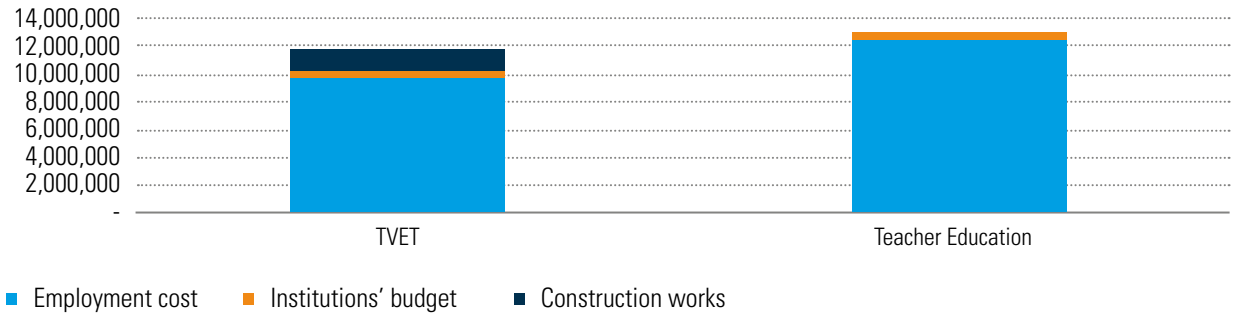


Source: 2018 World Bank Survey

Budget Allocation at the Institutional Level

97. Public funding for TVET institutions and teacher training colleges is almost entirely used to cover staff salaries and benefits, leaving little room for operational spending. Teachers and staff at public TVET institutions and teacher training colleges are public servants paid directly by government, and their salaries and allowances account for 83 percent and 96 percent of the budget allocated to TVET and teacher education, respectively (Figure 58). Beyond employment costs, public budget allocations to these institutions are very low. For example, the 2016 budget allocated US$50,000 to each public TVET institution and teacher training college for non-personnel expenditures. Even if that allocation were fully disbursed, it would hardly cover basic operational expenditures and minor repairs, and financing investments in new equipment, supplies, and facilities would be beyond the reach of the institutions. However, a separate budget appropriation is devoted to construction projects and equipment purchases by TVET institutions.

FIGURE 60 EXPENDITURES COVERED BY PUBLIC FUNDING AMONG TVET INSTITUTIONS AND TEACHER TRAINING COLLEGES, 2016 (US$)



Source: Budget Blue Book, 2016

Note: Employment cost include basic salaries, housing allowance and transport allowance

98. Faced with very modest public funding, TVET institutions and teacher training colleges primarily finance their operational and investment expenses through own-source revenue. In 2017, public funding for non-personnel expenses at TVET institutions totaled just US$500,000, whereas their total own-source revenue exceeded US$18 million. A similar pattern was observed among teacher training colleges. However, no detailed information is available on how these institutions spend their own-source revenue.

Summary

At 8.5%, Zimbabwe's tertiary enrollment rate is yet to match the level of regional leaders, such as Botswana (23.4%), South Africa (20.5%), and Kenya (11.7%). While Zimbabwe has six private universities, a large majority of tertiary students (90%) are enrolled in public institutions. Infrastructure constraints and tuition fees limit tertiary education access. High tuition fees contribute to significant dropout rates in both public and private universities. Several factors undermine the quality of the teaching and learning environment, including shortages of academic staff and outdated curricular and pedagogical practices. In spite of the economic crisis, Zimbabwe has managed to maintain a relatively high level of quantitative research output. From a governance viewpoint, Zimbabwe's tertiary education sector suffers from several organizational and institutional weaknesses: lack of articulation between higher education and tertiary education, incomplete MIS, and lack of institutional autonomy. In terms of resource mobilization, Zimbabwe's economic crisis over the past decade has deprived the tertiary education sector of much-needed funding. Finally, as far as resource allocation is concerned, history-based budgeting drives the allocation of funding to Zimbabwe's tertiary education sector, resulting in large and unjustified variations in per-student funding across institutions.

05 THE WAY FORWARD: POLICY OPTIONS TO REVITALIZE ZIMBABWE'S TERTIARY EDUCATION

99. After many years of crisis, a comprehensive approach is needed to revitalize Zimbabwe's tertiary education system. This section presents a range of policy options that the Government could consider in the following areas: (A) Defining a vision for the future; (B) Expanding Access and Increasing Equity; (C) Improving the quality and relevance of tertiary education programs; (D) Building research capacity and accelerating technology transfer; (E) Putting in place appropriate institutional governance and management arrangements; and (F) Developing a sustainable financing strategy.

A. Defining a Vision for the Future

100. Prior to the new dispensation, Zimbabwe's tertiary sector suffered from a lack of comprehensive strategic planning, which was exacerbated by the country's economic crisis, and the most urgent priority for revitalizing the sector was to elaborate a bold but achievable vision for its development. A strategy should set targets for the overall size of the tertiary sector and its institutional configuration in line with the government's overarching goal of producing highly qualified graduates and valuable research to support Zimbabwe's economic recovery. In this context, the Education 5.0 document and a Five-year Strategic Plan prepared by the MHTESTD are welcome steps, as these establish a sound framework for elaborating a comprehensive vision for the tertiary education sector.

BOX 2 EDUCATION 5.0: CRAFTING A VISION FOR ZIMBABWE'S TERTIARY EDUCATION SECTOR

Education 5.0 establishes five strategic goals for Zimbabwe's tertiary education system:

- The robust production of education-related goods and services;
- A growing supply of high-quality education programs supported by modern physical and financial infrastructure;
- A heritage-based approach[27] to science and technology;
- Educational outputs that contribute to the development of an industrialized economy; and
- Robust governance structures that enable the tertiary education sector to support Zimbabwe's modernization and industrialization.

Source: Ministry of Higher and Tertiary Education, Science and Technology Development, 2019

101. Once articulated, Zimbabwe's strategic vision must be operationalized through a long-term comprehensive master plan. This plan should include four essential components. First, it should set long-term quantitative targets for the expansion of the various subsectors and the balanced and complementary evolution of the sector's institutional composition. Second, it should establish overall goals for qualitative improvements, including measures to enhance the relevance of educational programs to the needs of the private sector. Third, it should outline priority reforms designed to strengthen institutional governance and ensure sustainable financing. Fourth, the plan should include provisions for building the implementation capacity necessary to achieve its objectives, including monitoring and oversight mechanisms. The strategic vision and the implementation plan should address the following questions:

- How will tertiary education support Zimbabwe's economic recovery and slow down, or even reverse, emigration among highly trained professionals?
- What quantitative targets will the government pursue with respect to overall enrollment growth, equal opportunities for students from vulnerable groups, educational attainment among the adult population, and research output?
- Is the current balance between universities, teacher training colleges, and TVET institutions consistent with Zimbabwe's human-capital requirements and long-term development objectives? Does the system allow students to move easily between institutions?
- Would Zimbabwe benefit from developing "centers of excellence" designed to conduct advanced research in priority areas?
- Are the tertiary education system's current quality assurance mechanisms adequate? If not, how can they be improved?
- Do the system's governance arrangements create an appropriate regulatory framework to support innovation and the adoption of international best practices?
- What level of public and private resource mobilization would be necessary to achieve the government's objectives in a sustainable manner?

102. When designing a long-term strategic vision and plan for the tertiary education sector, Zimbabwean policymakers should draw on the experience of the world's most successful tertiary systems. The U.S. State of California is home to 10 of the top 100 universities in the Shanghai 2018 ARWU ranking, and its achievements are a direct result of the clear and wide-ranging vision elaborated in the 1960s and embodied in the state's Higher Education Master Plan, which defined the roles of different institutions, from junior colleges to top research universities, and established mechanisms to allow students to move between those institutions (Box 3).

BOX 3 A LONG-TERM VISION FOR TERTIARY EDUCATION IN CALIFORNIA

California pioneered the use of strategic policy frameworks for state-level tertiary education systems when it developed and implemented its first Higher Education Master Plan in 1959-60. The strategy focused on balancing the roles of the public and private sectors and creating a robust public-sector governance framework that would promote expenditure efficiency and ensure high service quality. The California Master Plan for Higher Education is revised about every 10 years. It is not a rigid blueprint for the centralized control of tertiary education in California. Instead, it sets some general parameters for the sector's development designed to balance the growth of different types of institution and the promote overall equity, quality, and efficiency of tertiary education. The fundamental principles that emerged from the initial master plan still shape the state's tertiary education sector. These include:

- The recognition that different types of institutions (the University of California system, the California State University system, community colleges and junior colleges, and private institutions) have different missions and roles in the tertiary education sector;
- The establishment of a statutory coordinating body for the entire sector;
- The use of differential admissions pools for universities and state colleges;
- The eligibility of students attending private institutions to apply for the state scholarship program; and
- The availability, since 1965, of grants from the federal government for low-income students (Pell Grants).

Source: Salmi, 2017

B. Expanding Access and Improving Equity

103. Given Zimbabwe's relatively low level of tertiary enrollment, the dominant position of public universities in the tertiary sector, and the government's limited resources, policymakers may wish to consider an expansion strategy based on institutional differentiation. Institutional differentiation leverages the complementary advantages of various institution types and education modalities to create a flexible and adaptive labor force. The experience of countries as diverse as China, South Africa, and Thailand shows that spreading enrollment growth across a variety of tertiary education institutions and delivery modalities can expand the supply of tertiary education in a way that is both more fiscally sustainable and more appropriate to the needs of a growing economy. South Africa's experience with institutional differentiation yields especially relevant lessons for Zimbabwe (Box 4).

BOX 4 SOUTH AFRICA'S SHAPE AND SIZE TASK FORCE

To develop a broad strategy for modernizing and improving tertiary education in South Africa, the country's Council on Higher Education established the Shape and Size Task Force, which was tasked with formulating a comprehensive plan for diversifying the supply of tertiary education. The task force "made the case for higher education as a potentially powerful contributor to, and necessary condition for, achieving the goals of social equity, economic and social development and democracy" and recognized that "[h]igher education's primary role is to develop the intellectual and skills capabilities of our society to address and resolve the range of economic (including labour market), social, cultural, political and other challenges faced by society. It must do so at a national, regional and local level as well as contribute to the development of the continent. Higher education must also play a central role in meeting the difficult realities of international competition under the new conditions of globalization." The task force concluded that to maximize its potential, the tertiary education sector needed to become more differentiated and diversified. To accomplish this objective, the task force support to five types of institution and educational modality:

1. Institutions dedicated to high-quality undergraduate education that provide equitable access for urban and rural students across the country.
2. Sophisticated research universities that provide undergraduate and graduate degrees to boost the supply of "high-level knowledge producers of national and international standing" across all academic disciplines.
3. Institutions focused on master's and doctoral programs in three priority areas: humanities and social science, business studies, and science, engineering, and technology.
4. Distance-education programs, including those offered at campus-based institutions and by dedicated distance-providers, which may provide undergraduate and/or graduate training, depending upon their capacity to meet national accreditation standards. 5. Private tertiary education institutions, the establishment of which was authorized in 1997 to meet the growing demand for tertiary education, and which are subject to accreditation and regulation standards to assure quality and minimize any potential detrimental effects on the public tertiary education system.

Source: Task Force, 2000, Chapter 3

104. Community colleges designed after the North American or South Korean model can help absorb a large share of the student population at a reduced cost compared to universities. Community colleges occupy an important place in the tertiary education systems of developed countries, providing a flexible and responsive solution to the demands of both students and employers. In Canada, 42.8 percent of the undergraduate population was enrolled in community colleges in 2017. South Korea has almost as many junior colleges (152) as universities (178). In the United States, the share of community college enrollment in total post-secondary was 43 percent in 2017. Students who reach only O-level could access community colleges after taking foundation courses and demonstrating that they

have acquired the basic academic level needed to study in a community college.

105. Distance education can provide an important complement to traditional tertiary institutions. Established in 1999, Zimbabwe Open University (ZOU) is the country's only distance-education institution. ZOU has about 30,000 graduates in total, and it could absorb a significantly larger share of students. The National University of South Africa (UNISA), which is the largest distance-education institution in Africa and one of the world's top 30 mega-institutions, provides a natural role model for ZOU. Another positive example is Thailand, where two open universities enroll close to half of the total student population, including a large share of students from poor households and rural areas.[28] Due largely to its open universities, Thailand's tertiary enrollment rate exceeds that of neighboring Malaysia, even though the latter spends a larger share of its GDP on tertiary education. The open universities also contribute to Thailand's remarkable equity indicators: in Thailand, the share of 25-29-year-olds from the poorest income quintile who have completed at least two years of tertiary education reached 26.7 percent in 2014, an order of magnitude above the levels of regional peers such as Indonesia (2 percent), Vietnam (3 percent), and the Philippines (4 percent).

106. Quality control is a critical challenge for distance education. Before taking steps to increase ZEO's share in total tertiary enrollment, the authorities should strive to enhance the quality and relevance of its programs, increase completion rates, and promote positive labor-market outcomes. Technology-driven innovations and personalized learning experiences could significantly enhance the effectiveness of the distance education programs offered by ZEO and other institutions.

107. Many countries have encouraged the growth of private universities to help meet a growing demand for tertiary education while further diversifying its institutional composition and easing pressure on the government's education budget. Zimbabwe's private tertiary education subsector accounts for just 10 percent of total enrollment, and two sets of measures could accelerate its growth. First, the MHTESTD and ZIMCHE could amend the existing regulatory framework to eliminate legal and administrative hurdles that could constrain the establishment and development of private tertiary education institutions while ensuring that licensing and accreditation requirements remain rigorous enough to guarantee high quality standards. In line with international trends, requirements should focus less on inputs (e.g., facilities and equipment) and more on measures of service quality (e.g., faculty credentials, pedagogical practices, and institutional governance) and outcome indicators (e.g., graduation rates and research output). Second, the government could offer limited subsidies to private tertiary education providers. For example, accredited private institutions could be allowed to compete for research grants in priority areas, such as engineering or applied sciences. The government could also lease public land to private tertiary education institutions at a low cost. Finally, students who are enrolled in accredited private institutions should be eligible for financial aid.

108. Equity-promotion policies could complement institutional differentiation by reducing disparities in access to and success in tertiary education. The most effective equity-promotion policies address both the financial and non-financial elements of tertiary education access.[29] Well-targeted and efficiently managed financial aid can be instrumental in reducing financial barriers to tertiary education, and Zimbabwean policymakers should consider three key financial issues: tuition fees, student loans, and scholarships.

109. Tuition fees represent a very large share of tertiary education income in Zimbabwe and create a substantial barrier to students from lower-income households. In Zimbabwe, the most equitable and sustainable approach would be to gradually implement a targeted free tuition scheme for the students from the most disadvantaged backgrounds.

110. Creating a national student loan scheme could further ease financial constraints on tertiary education access. Such a system could build on the EduLoan program launched in September 2018, while incorporating lessons from the international experience. Many factors determine the success or failure of a student loan scheme, including design considerations, interest rates, administrative costs, the strength of its leadership, the quality of its management, and its ability to rapidly address emerging challenges, but collection efficiency is the most critical element. No student loan program can succeed unless its collection mechanisms are well designed and effectively administered.[30]

111. Traditional, mortgage-type student loan schemes such as the one managed by EduLoan are intrinsically vulnerable. Without an income-contingent provision, repayment rates will inevitably fall during economic downturn, as former students face high unemployment rates and weak income growth. The international experience shows that income-contingent loans modeled on those used in the Australia and New Zealand tend to have higher repayment rates. Under an income-contingent system, former students repay a fixed share of their income rather than a nominal sum, and they are exempt from repayment obligations during periods of unemployment or if their income is below a predetermined threshold.

C. Improving the Quality and Relevance of Tertiary Education

113. Improving the quality and relevance of tertiary education in Zimbabwe will require a combination of interventions. These interventions should target four key determinants of education quality and relevance: (i) the preparation of incoming students; (ii) the qualifications of academics; (iii) curricular and pedagogical practices; and (iv) links to the productive sectors.

114. Improvements in secondary education can better prepare incoming tertiary students. Expanding math and science education, promoting STEM-based career paths, and offering targeted STEM mentoring activities and scholarships to girls could boost the readiness of new tertiary students to succeed in STEM programs. Academic and career counseling programs could further enhance the preparation of incoming students, especially students from poor households and marginalized communities. Academic and career counseling should incorporate the perspectives of multiple stakeholders the Ministry of Education, the MHTESTD, the Ministry of Labor, the Ministry of Economy, tertiary education institutions, and chambers of commerce. Outreach and bridge programs that link secondary and tertiary education institutions can further improve transition rates and increase the probability of student success at the tertiary level, especially among at-risk students. These programs seek to reduce the academic, aspirational, informational, and personal barriers that restrict access among students currently underrepresented in tertiary education institutions. Universities can also address deficiencies in student preparation by offering foundational courses that build knowledge and skills in specific areas.

115. Predictive analytics offers a promising avenue for identifying at-risk students and reducing dropout rates, especially among first-generation tertiary students. About 40 percent of US universities have experimented with using data analysis and innovative tools, such as digital dashboards and heat maps, to detect early behavioral changes associated with academic difficulties (Box 5).[31] For example, Ball State University in Indiana monitors both the academic engagement of students and their social activities to identify shifting behavioral pattern that may indicate academic difficulty, enabling retention specialists to intervene and offer academic and psychological support as needed. Arizona State University's eAdvisor system, which flags at-risk students, has been credited with boosting completion rates for students from vulnerable groups from 26 to 41 percent since its establishment in 2007.

BOX 5 THE PROMISE OF PREDICTIVE ANALYTICS

The experience of Georgia State University (GSU) illustrates how the use of predictive analytics is changing tertiary education in the United States. GSU's students are 60 percent nonwhite, and many are the first in their families to enroll in tertiary education. GSU uses predictive analytics to advise students on the majors they are most likely to succeed in based on their grades in prior courses. An early-warning system based on a dataset of 2.5 million course grades issued over 10 years is used to identify critical factors that reduce the probability of graduation. For example, an academic adviser will get a red flag if a student does not receive a satisfactory grade

in a course needed for his or her major, does not take a required course within the recommended time, or signs up for a course that is not relevant to his or her major. This system has yielded impressive results: graduation rates are up 6 percentage points since 2013; students are graduating an average of one semester earlier than they did before, saving an estimated US$12 million in tuition; and low-income, first-generation, and minority students have closed the graduation-rate gap, including in STEM majors.

Source: Blumenstyk, 2014; Kamenetz, 2016; Salmi and Orjuela (forthcoming)

116. Improving the qualifications of academics will be critical to enhance tertiary education quality in Zimbabwe. To meet the growing demand for qualified academics and the shortfall in PhD holders, universities can strive to: (i) attract qualified Zimbabwean academics from the diaspora, (ii) expand their master's and doctoral programs and hire their own graduates as teaching staff; (iii) expand international training opportunities for Zimbabwean academics; and (iv) allow academic staff to work on a contract basis at other universities in addition to their primary employer.

117. Increasing the share of qualified female academics could greatly enhance the quality of teaching, learning, and research in Zimbabwean universities. Gender balance among university staff has been shown to produce better academic results and improved management decisions.[32] In the mid-2000s, Harvard University attempted to address its gender imbalance by: (i) appointing institutional leaders to focus on the issue; (ii) establishing a high-profile office responsible for promoting gender balance; (iii) publicizing research showing the importance of diversity and highlighting successful policy measures; (iv) continuously improving recruitment and promotion policies and practices; (v) strengthening family-support programs for academics; evaluating the impact of the university's policies on gender balance; and participating in institutional networks to share lessons learned and disseminate good-practice principles. Zimbabwean universities could draw on the experience to create offices responsible for promoting gender balance by facilitating the recruitment and retention of female staff and by promoting respect for gender diversity within the student body and the elimination of all forms of direct and indirect discrimination against female students.

118. Curricular and pedagogical reforms should focus on modernizing program content and enhancing delivery. To create incentives for tertiary education institutions to transform their approach to teaching and learning, the Zimbabwean authorities should encourage universities to move away from traditional pedagogical methods and embrace a more interactive, collaborative, and experiential approach. As automation and digitization continue to change the nature of work, traditional teaching methods are increasingly ill-suited to the development of the sophisticated cognitive and socioemotional skills demanded by employers. Meanwhile, mounting evidence from the educational and cognitive sciences indicates that interactive pedagogical approaches facilitate a more effective learning experience.

119. Adopting innovative pedagogical techniques can enhance the quality and relevance of teaching and learning. For example, under the problem-based learning methodology students learn about a topic and acquire competences by working in groups to solve open-ended problems. Cooperative education alternates academic studies with relevant work experience in a field directly related to a student's academic or career goals, while multidisciplinary programs integrate content from multiple subject areas to foster creativity and innovation. Recognizing that motivation can be as important to learning as academic ability, a growing number of institutions have launched flexible competency-based programs that allow students to build an individualized curriculum aligned with their specific interests and goals. Technological developments in online education, self-guided instruction, peer-to-peer learning, team-based learning, the "flipped classroom" model, and digital simulations utilize computers, artificial intelligence, and machine learning can support these innovative pedagogical practices.

120. Establishing well-resourced teaching and learning centers in all tertiary education institutions could support the adoption of new pedagogical

methods. These centers would facilitate active learning methods, including design-based or problem-based learning, gaming, simulations, role-playing, peer-to-peer learning, artificial intelligence software for independent learning, etc. They would also provide training to academic staff, including capacity-building workshops and mentoring, to encourage the use of innovative pedagogical approaches (Box 6).

BOX 6 THE TRANSFORMATION OF TEACHING AND LEARNING AT OLIN COLLEGE

Franklin W. Olin College of Engineering, a small private college in Wellesley, Massachusetts, has implemented a radically interactive, collaborative, and experiential learning model. Since 1999, Olin College has served as an experimental laboratory designed to remake engineering education by attracting the right students, teaching the right curriculum, embracing cutting-edge teaching methods. To identify future innovators and leaders, it recruits its students primarily through face-to-face interviews and team exercises, rather than relying on test scores and grades. Learning is mainly organized around team-based projects and design activities. Olin College has no academic departments and does not offer tenure to its faculty members, which fosters an academic culture emphasizing interdisciplinary learning and educational innovation. A typical program will involve several teachers from different disciplines providing integrated courses with interdisciplinary material. The curriculum combines engineering, entrepreneurship, and humanities in a unique way. Olin students are also expected to acquire leadership and ethical competencies through social sciences and humanities courses, and they cross-enroll at Babson College and Wellesley College for entrepreneurships and humanities courses, respectively. To ensure that all Olin graduates can successfully communicate in a professional setting, every student is required to publicly present an aspect of their academic work at the end of every semester. To graduate, every Olin student must start and run a business and complete a year-long senior design project sponsored by the private sector. The firms that sponsor these projects often recruit the students involved after they graduate. In less than 20 years, Olin College has achieved impressive results. Based on a survey of 130,000 students, Princeton Review placed Olin among the top 20 US colleges in 15 categories of performance, ranking it third for students studying the most and nineteenth for happiest students. Olin has been particularly successful in attracting young women into its engineering programs. While female students account for just 20 percent of enrollment in US engineering programs, at Olin they account for 40 to 50 percent. According to a recent survey, 97 percent of Olin alumni were either employed—many in a firm they started themselves—or attending graduate school.

Source: Buderi, 2014

121. Several countries have established specialized agencies dedicated to promoting pedagogical good practices. For example, Australia's Office for Learning and Teaching, established in 2011 as part of the Ministry of Education, offers competitive grants to academics interested in exploring and implementing innovative teaching practices. The office also contributes to designing education policy, disseminates the findings of relevant analytical work, and presents awards for teaching excellence throughout the Australian tertiary education system.

122. International experience yields several important lessons for promoting innovative teaching and learning practices. Some countries, including the United Kingdom, require all PhD candidates to obtain a teaching certificate before completing their doctorate. Others offer incentives that reward teaching excellence the same way that outstanding research is rewarded. Others have introduced innovative teaching and learning practices that promote interactive and collaborative learning, in some cases also remodeling the physical infrastructure and environment of universities. From the "flipped classroom" model, in which the professor does not teach per se, but rather guides and facilitates self-learning and peer learning, to studios and open-space classrooms designed to support design-based learning in teams, these new learning facilities offer a flexible environment that differs substantially

from the traditional classroom and lecture hall. However, curricular and pedagogical innovations can transform learning only if the assessment criteria and processes are fully aligned with the educational experience of the students.

123. Strengthening linkages with industry can improve the employment prospects of tertiary graduates. Universities can obtain internships for undergraduate students and in-company placements for research students and academics, and they can encourage private-sector professionals to offer their services as visiting lecturers. Incorporating entrepreneurship training into regular university programs can help increase their relevance to the private sector, and universities can establish cooperative learning programs that alternate on-campus learning periods with regular in-firm internships (Box 7). Efforts to bring universities closer to industry are not restricted to applied sciences and other business-related disciplines. Cooperative education programs can also target the social sciences and humanities, so long as appropriate employers (e.g., museums, libraries, or other cultural institutions) can be identified and engaged as partners.

BOX 7 LESSONS FROM COOPERATIVE EDUCATION PROGRAMS

Under the cooperative education model, students combine academic studies with work experience in a field related to their academic or career goals. Cooperative education allows students to gain relevant work experience, apply theoretical knowledge to real-world situations, clarify their career plans, and build their professional networks by establishing connections with prospective employers and colleagues. Working can help students finance their education while learning on valuable job skills and professional competencies. Cooperative education also offers advantages for employers by giving them "access to well-prepared short-term workers, flexibility to address human resource needs, cost-effective long-term recruitment and retention, partnerships with schools, and cost-effective productivity."[33]

The University of Waterloo in Ontario, Canada operates the world's largest cooperative education program, which involves 15,800 undergraduate students representing over 56 percent of the university's full-time undergraduate, as well as 3,500 partner employers around the world.[34] Students in the cooperative education program graduate with the same number of academic terms as other students, plus up to two years of work experience. Cooperative education students are employed for four to six periods of four months each, and most work in a variety of career fields. Cooperative education students typically earn between $25,000 and $74,000 prior to graduation, enabling them to repay student loans much more quickly than other students. Graduates of the cooperative education program earn an average of about 15 percent more upon graduation than other graduates. The University of Waterloo also offers a cooperative education program focusing on entrepreneurship, in which students receive support from experienced professionals, and in some cases economic resources, to develop their own businesses.[35]

Source: The World Association for Cooperative Education (WACE); The National Commission for Cooperative Education; StudyinCanada.com; University of Waterloo, Canada; and The National Center for Tertiary Teaching Excellence, New Zealand.

124. It is fundamental to strengthen the existing quality assurance functions carried out by ZIMCHE. The registration, accreditation and institutional audits for which ZIMCHE is responsible must be undertaken with the appropriate level of professional independence and technical capacity to enforce high quality standards throughout the tertiary education system.

125. In addition to strengthening the official quality assurance mechanisms at the national level, the Zimbabwean Government should also consider offering incentives for the establishment and/or consolidation of internal quality assurance units in all tertiary education institutions, which are essential for the development of a genuine and effective quality assurance culture.

D. Building Research Capacity and Accelerating Technology Transfer

The National Science and Technology Policy

126. To build the research capacity of Zimbabwe's top universities, the government must: (i) articulate a clear science and technology strategy, and (ii) increase public funding for research. Building Zimbabwe's research capacity will be critical to accelerate the country's economic recovery and achieve its development objectives. Incentives that encourage the return of Zimbabwean researchers working abroad and foreign exchange programs for PhD students will be instrumental to this effort. To facilitate the integration of doctoral graduates into dynamic research teams, the authorities should also consider emulating government-sponsored postdoctoral programs in countries such as Pakistan, which offers accredited universities the opportunity to hire promising young researchers for up to two years at little or no cost.

127. As they devise a strategy for building the country's research capacity, the authorities should take steps to maximize the value of their limited resource envelope. One of the most important goals of the national science and technology strategy should be to determine the optimal number of research-oriented universities to which the government can commit adequate long-term funding. The authorities should also seek to focus the country's existing research capacity on national priorities. The Australian government's experience with developing a new research agenda could yield important lessons for Zimbabwe (Box 8).

BOX 8 A NEW RESEARCH AGENDA FOR AUSTRALIA

The Australian government recently announced its National Innovation and Science Agenda, which will be financed by an initial allocation of US$790 million over four years. The agenda's goal is to encourage "smart ideas that create business growth, local jobs and global success." The strategy's multiyear scope signals a new era of systematic, ongoing science funding, and it establishes a central oversight agency for publicly funded scientific research. The agenda will include a flexible funding stream to support university research and a training program for the next generation of researchers and innovators. Under the National Innovation and Science Agenda, the government will invest in four priority areas:

- *Culture and capital,* to help businesses manage risk and incentivize early investment in startups;
- *Collaboration,* to strengthen engagement between firms, universities, and the research sector, enhancing their ability to commercialize innovations and solve problems;
- *Talent and skills,* to train Australian students for the jobs of the future and attract the world's most innovative talent to Australia; and
- *Government as an exemplar,* to use cutting-edge public investment processes and e-government services as a model for the private sector.

A government statement on the agenda identified innovation as the heart of a strong economy but noted that it is "not just about new ideas, products and business models; innovation is also about creating a culture where we embrace risk, move quickly to back good ideas and learn from mistakes." According to the Department of Education and Training, the agenda will ensure that high-quality research drives innovation "that saves lives, answers social and environmental imperatives, improves economic productivity and growth, and creates the jobs of the future."

Source: O'Malley, 2015

Research funding

128. Worldwide, at least six discrete funding mechanisms are used to support university-based research. These include: (i) combined funding for instruction and research; (ii) competitive research grants; (iii) performance-based research block grants; (iv) direct funding for "centers of excellence"; (v) "excellence initiatives"; and (vi) demand-side funding.[36] The sources of research funding also vary

and may include national and state governments, national and state research councils, private firms, and nongovernmental institutions.

Combined funding for teaching and research is a traditional and widely used approach for financing university-based research. Under this mechanism, universities rely on budgets or financing formulas that fund research and instruction together, and they use a share of the resources they receive to finance research in addition to their core teaching activities. The main advantage of this system is that it encourages integrated teaching and research efforts, and its primary downside is that it gives policymakers little scope to influence the direction of research or promote the efficient use of resource funding. From the university's perspective, the key risk is that any decrease in core funding could reduce the resources available for research.

- ***Competitive research grants are a common means of allocating public resources for research*** under which faculty members apply for funding for specific research project, and their proposals are either approved or rejected based on a peer-review process. Multiple public agencies are usually responsible for funding competitive grant, and in some jurisdictions, such as Singapore and New York state, public funding is complemented by matching grants from nongovernmental institutions or private sources. The use of peer review to assess the quality and potential of research proposals partially insulates the process from political pressure. However, the biased selection of peers to favor institutional insiders over dissenters may stifle innovation, narrow the scope of research agendas, and undermine the quality and relevance of the funded projects.

- ***Performance-based block grants*** are a relatively rare mechanism under which universities receive non-earmarked research funding based on the past performance of university institutions or academic units. The amount of public research funding for each university is based on a regular peer-reviewed assessment of the faculty's collective capacity to conduct innovative and valuable research. In Australia and the United Kingdom, for example, the "blue skies" approach to allocating research funding allows researchers to choose their areas of study, whereas the competitive funding provided by national research councils is determined by qualitative assessments of research quality conducted every five to seven years.

- ***Funding "centers of excellence"*** allows policymakers to provide block grants to institutions that specialize in certain fields of study. The U.S. federal government and several state governments use this approach to supplement their core research funding, while New Zealand and the Netherlands fund much or all of their academic research through centers of excellence, and France and Germany fund a network of research institutions that operate independently from universities. Funding centers of excellence can enable the government to prioritize funding by academic area while still offering institutions considerable latitude to determine their own specific research agendas.

- ***"Excellence initiatives"*** are hybrid financing mechanisms that combine elements of competitive research funding and the "centers of excellence" approach to provide additional resources to universities or research institutions on a competitive basis. China has implemented a series of excellence initiatives over the past 20 years, which has inspired similar programs in Denmark, France, Germany, and Russia.

- ***Demand-side funding*** for university-based research is provided indirectly through scholarships, fellowships, and other forms of support for graduate students and postdoctoral researchers. Canada, the United Kingdom, and the United States exemplify the demand-side approach, as the various agencies that fund research offer a range of programs to support graduate student.

129. An analysis of the distribution of research funding in nine high-performing OECD countries reveals that most rely on a variety of complementary funding instruments. Separate funding streams can be used to advance national research priorities while allowing institutions the scope to develop their own research initiatives. The diversification of funding sources also helps protect universities from budgetary volatility. Across the sample countries, the two most important financing mechanisms are combined funding for teaching and research and competitive grants (Table 7). An analysis of funding mechanisms in South Africa, the regional leader in research, reveals that about half of the country's

research budget comes from combined funding for teaching and research, while just over one quarter is provided to centers of excellence, and the remainder is split between demand-side funding and competitive research grants, with a marginal contribution from performance-based block grants.

TABLE 10 RESEARCH FUNDING MECHANISMS IN NINE OECD COUNTRIES

Mechanism	AUS	CAN	DEN	GER	NET	NOR	SWI	UK	US
Combined funding for teaching and research		✔		✔	✔		✔		✔
Competitive research grants		✔	✔			✔		✔	✔
Performance-based block grants	✔		✔			✔		✔	
Centers of excellence		✔			✔				
Excellence initiatives	✔	✔	✔	✔		✔			
Demand-side funding		✔			✔			✔	✔

Source: Salmi (2015)

130. The Zimbabwean government should carefully review all the mechanisms described above and design a strategy that reflects its circumstances and ambitions. Building research capacity to support increased national and regional innovation is a complex and expensive process, and the government's strategy should embrace a long-term perspective that accounts for its limited public resource envelope and maximizes private-sector engagement.

Talent Development at the Institutional Level

131. An institution's ability to attract and retain a mix of young, promising researchers and older, more experienced researchers is critical to its overall research capacity. While several Zimbabwean universities have strong research teams, institutions with the potential to become more research-intensive must develop capacity-building programs and provide adequate incentives to encourage and reward high-impact research. These incentives could include financial rewards for performance, flexible schedule arrangements that would reduce the teaching responsibilities of highly productive researchers, and opportunities for academic mobility and participation in international research networks. Specific efforts to encourage experienced researchers working abroad to return to Zimbabwe, or to collaborate with Zimbabwean universities remotely, could rapidly enhance university research capacity. To improve gender equity and maximize the value of Zimbabwe's human capital, universities should use monetary and nonmonetary incentives to attract qualified female academics to research programs.

Strengthening Research Collaboration

132. Zimbabwean universities can enhance the quality and quantity of their research output by collaborating with the private sector and participating in international research networks. Strong universities can make a powerful contribution to local and national development, both directly and through spillover effects. The successful growth of technology clusters in California's Silicon Valley, Bangalore in India's Karnataka State, Shanghai in China, and Campinas in Brazil's São Paulo State attest to the powerful complementarities between research universities and technology-oriented firms. Even individual institutions can have a major local impact, though university policies play a key role in determining the institution's relationship to the local economy (Box 9).

BOX 9 THE LOCAL ECONOMIC IMPACT OF UNIVERSITIES: THE CAMBRIDGE MODEL

The top two British universities, Oxford and Cambridge, share a similar history and stem from the same academic culture, and both are considered among the best universities in the world. Yet they differ significantly in terms of their impact on their respective cities. Oxford remains a traditional university city, whereas Cambridge has become one the most successful technology clusters in Europe. Beginning in the 1970s with the creation of business parks to welcome entrepreneurial academics and their doctoral students, Cambridge has evolved into a hub of 4,000 knowledge-intensive firms in fields such as electronics, pharmaceutics, and biotechnology. With a productivity level 30 percent higher than London's, Cambridge generates more patents that the next six British cities together; it hosts more billion-dollar firms than cities ten times its size, and its unemployment rate is extremely low. Cambridge's success reflects its enlightened policies, investments in key infrastructure, and welcoming economic environment. The university has worked closely with the city council and the neighboring authorities to create a favorable innovation ecosystem by setting up science parks and incubators, encouraging business and housing developments, attracting investors, and lobbying the government for more open immigration policies while refraining from imposing strategic priorities or micromanaging the city's economic development. The municipal authorities do not pick winners, and the university offers incentives to entrepreneurial scholars—tightening the links between academia and the private sector. This approach has enabled Cambridge University to transform its local economy while maximizing its impact on national productivity.

Source: The Economist (2015)

133. In addition to their direct contribution to their local economies, universities can accelerate national economic growth by conducting applied research and enhancing the skills of the labor force. Universities in advanced economies often focus on basic research and the development of new innovations, but universities in developing countries can play an equally critical economic role by facilitating technology transfer. By establishing technology incubators or forming partnerships with industrial parks, Zimbabwe's leading universities could help adapt foreign technologies to suit the local context. Enhancing the contribution of Zimbabwean universities to technology transfer would require systematic efforts to pursue industry-oriented research and identify opportunities to commercialize imported technologies.

134. Technology transfer involves more than merely adapting innovations to meet local demands. Table 8 provides a summary description of the principal modalities of collaboration on knowledge transfer and technology commercialization that Zimbabwean universities could consider developing. To be sustainable, the transfer of physical technology must be complemented by the transfer of knowledge, skills, and organizational competencies. Academic institutions can play a critical role in transferring the technical capacity necessary to utilize new technologies. Involving firms in curriculum design can help ensure that education programs focus on employer-relevant content. Regular collaboration with teaching staff and the creation of student internships can also facilitate the spread of cutting-edge ideas from academia to the private sector. Finally, organizing events that showcase new technologies can enable universities can act as knowledge-exchange platforms for the private sector.

TABLE 11 MOST EFFECTIVE KNOWLEDGE- AND TECHNOLOGY-TRANSFER MECHANISMS

University-Industry Linkages	Role of National and/or Local Authorities	Comments
Public space function for networking and dissemination	Develop and fund programs to create and support clusters	With education and training, this function is seen by firms as the most important contribution of universities
Human capital formation (students and firm employees)	Priority setting and incentives for establishment of new programs Targeted scholarships Funding and tax incentives to facilitate insertion of Ph.D graduates	Primary role of universities in support of innovation
Research	Matching grants and tax incentives Criteria for evaluating the performance of researchers	Increased returns at the intersection of traditional disciplines
Problem-solving and consulting	Support for cluster formation Targeted assistance to SMEs	
Sharing of technical infrastructure	Funding	Need for clear revenue sharing arrangements within universities
Knowledge commercialization	Appropriate IPR legal framework Technical assistance Financial autonomy of public universities	More likely to happen in biotechnology, nanotechnology, new materials and IT

Source: Elaborated by Jamil Salmi

135. Strategic partnerships between Zimbabwean universities and foreign universities can accelerate technological capacity-building and enhance the ability of the tertiary education sector to serve as conduits for technology transfer. Some Zimbabwean universities have already formed international partnerships to support academic and student mobility. To strengthen the impact of international collaboration on research output and technology transfer, Zimbabwean universities could expand their strategic partnerships in line with the country's top development priorities. These partnerships would provide a framework for mutually beneficial collaborative research and knowledge transfer. They should include activities designed to strengthen Zimbabwean educational institutions, including joint academic programs, joint supervision of graduate students, joint research projects, joint community services, and joint benchmarking exercises designed to strengthen performance monitoring and guide strategic planning.

E. Appropriate Institutional Governance and Management Arrangements

136. Modernizing the administration of the tertiary education sector will require reforms under three strategic axes. The government's strategy should: (i) reform the sector's administrative framework; (ii) increase the autonomy of tertiary institutions; and (iii) ensure that those institutions are fully accountable for their academic performance and for their use of public resources. Specific reforms under each of these axes are described below.

137. The government could begin its administrative reform efforts by eliminating the distinction between "higher education" and "tertiary education." The presence of this rhetorical barrier is at odds with international best practices, and it needlessly complicates the administration of tertiary education by creating illogical bureaucratic rules and constraints. For example, non-university institutions are not classified as part of the "tertiary education" system and are therefore ineligible to access ZIMREN, the country's high-speed internet network. The artificial distinction between "higher education" and "tertiary education" is a major administrative barrier to institutional differentiation, as it systematically disadvantages the non-university subsector.

138. The MHTESTD should be solely responsible for coordinating the work of all the agencies involved in administering tertiary education institutions in Zimbabwe, while the ZIMCHE should play a supportive role as implementing agency. Consolidating the MHTESTD's leadership role would help ensure that all policy and funding decisions are fully coordinated and designed to support the complementary development of all tertiary education subsectors. The MHTESTD would be responsible for realizing the national vision for tertiary education, harmonizing resource allocation across tertiary education subsectors, and ensuring the institutional autonomy of all public tertiary education institutions. The MHTESTD would design a comprehensive plan for developing the tertiary education system, which the ZIMCHE would be responsible for implementing.

139. The MHTESTD would also be responsible for overseeing the design and implementation of a comprehensive MIS for the entire tertiary education system. The MIS should encompass all key dimensions of performance (access, equity, quality of learning, relevance of programs, research output and impact, governance, financing). Carrying out this important task could be delegated to ZIMCHE.

140. Effective institutional governance will require empowering and restructuring of university councils in Zimbabwe. University councils should have fewer members and a stronger administrative mandate. International experience shows that to function effectively university councils should have no more than 20 members, including external members.[37] The role of Councils in the appointing of the university leader, endorsing the strategic plan, and budget approvals should be strengthened. Council members should be appointed based on professional qualifications through a transparent selection process. Clear accountability requirements should underpin the increased autonomy of Zimbabwean universities. Over the past two decades, universities in many OECD countries have reformed their governance structures to give a stronger role to the vice-chancellors and the leadership team, while increasing their autonomy and strengthening their accountability.[38] These efforts have inspired similar reforms in several Sub-Saharan African countries.

BOX 10 REFORMING UNIVERSITY COUNCILS

University councils should regularly monitor their own effectiveness and assess the performance of their institution against its strategic plans and operational targets. Councils should perform a formal and rigorous evaluation of their own effectiveness at least once every five years, while other internal leadership bodies should be subjected to a parallel review process. These reviews should encompass the performance of the institution vis-à-vis its long-term strategic objectives, short-term performance indicators, and the benchmarks set by the institution's domestic and international peers. The academic leadership should provide input into the review process, and the outcome of the review should be published both internally and externally. Reviews may be performed by university staff, but outside specialists should be engaged whenever possible.

Based on the results of their performance reviews, universities in Kenya and Senegal have implemented reforms designed to enhance the effectiveness of their councils by reforming their selection processes and increasing their autonomy.

In Kenya, the passage of the 2012 Universities Act

substantially altered the process for appointing members to university councils. Whereas appointments were previously controlled by the government, the current system includes both a set of members appointed because of their positions in government agencies (e.g., the ministries if education and finance) and a set of members drawn from the private sector, who are appointed through a competitive and transparent process. A Selection Panel appointed by the Cabinet Secretary manages the process by advertising vacancies and publishing the names of applicants and shortlisted candidates in at least two national newspapers. The Selection Panel then forwards to the Cabinet Secretary three candidates for council chairperson and another nine candidates for council membership.

As part of a comprehensive reform effort launched in 2013, Senegal's government has taken measures to strengthen the management and accountability of tertiary institutions by introducing university councils. These councils, which called boards of directors in Senegal, have the authority to approve university business plans, budgets, and audits, and their mandate includes ensuring the pedagogic integrity of universities. Most council members are external to the university, including the chairperson. University rectors are no longer designated by the government but instead selected by the council after a professional search based on objective criteria.

Like Senegal, many countries have transferred the responsibility to select university leaders to the university council. The council typically conducts a competitive search that encompasses candidates from within and outside the institution. Denmark introduced this process in 2002-03, which has helped raise the international profile of Danish universities, and Finland has followed suit. Some countries have even allowed university leadership positions to be held by distinguished academics from other countries, though in most cases candidates are still required to be domestic citizens, and university leaders are often former academics of the recruiting university.

Source: World Bank, 2012;[39] World Bank, 2016; Niane, 2016.

141. International experience underscores the importance of institutional autonomy. Effective administration requires that tertiary education institutions have control over their own academic and financial resources, as well as sufficient latitude to make key internal decisions. Institutional autonomy is critical to the successful development of the public tertiary education sector, as autonomous institutions have been shown to be more responsive to performance incentives.[40]

142. Zimbabwe's tertiary education institutions' ability to exercise meaningful control over the factors that determine the quality and costs of their programs needs to be strengthened. While the institutions have certain levels of autonomy and authority to establish admissions requirements, to determine the size of the student body, to manage human resources, and to establish new programs and courses, they do not have full control over their tuition fees as Government guides tuition fees to guarantee equity and access to tertiary education. Tertiary education institutions should also have control over the eligibility criteria for students' financial assistance, and they should be able to reallocate resources internally according to self-determined and transparent criteria. These elements of financial autonomy enable institutions to strengthen weak academic units, cross-subsidize programs, and fund new initiatives quickly and flexibly in response to evolving needs.

143. Zimbabwean Universities need to introduce performance incentives for the academic staff as these greatly enhance the quality of teaching and research in universities. Universities should be allowed to establish reward systems for recognizing the performance and contributions of individual staff.

144. Increased institutional autonomy should be accompanied by a well-defined accountability framework. International good practices for institutional accountability require at least two types of annual report: (i) a financial audit report prepared according to international accounting standards; and (ii) an annual performance report showing progress against each of the university's own strategic objectives and yearly plan. Both reports should be submitted to the legislature, and the annual performance report should be published. These reports are part of a broad array of accountability instruments (Table 12) and are currently submitted annually to Government by each university in Zimbabwe.

TABLE 12 INSTITUTIONAL ACCOUNTABILITY INSTRUMENTS

Instruments \ Dimensions	Academic integrity	Fiscal integrity	Effective use of resource	Quality and relevance	Innovation	Equity
University instruments						
Strategic plans				x	x	x
Key performance indicators			x	x	x	x
Budgets			x			
Financial audits		x	x			
Student satisfaction surveys	x			x	x	
Graduate employment surveys				x		
Employers and alumni surveys				x	x	
Assessments of learning outcomes/ added value						
Annual report (submitted to the legislature and the public)			x	x	x	x
Governmental instruments						
Licensing				x	x	
Accreditation/academic audits/ evaluations	x		x	x	x	
Funding formulas			x	x	x	x
Performance contracts			x	x	x	x
Scholarships/student loans/vouchers			x	x		x
Student engagement surveys				x		
Labor market observatories				x		
Assessments of learning outcomes				x		
Rankings/benchmarking				x		

Source: Elaborated by Jamil Salmi

F. Developing a Sustainable Financing Strategy

145. A sustainable financing strategy for the Zimbabwean tertiary education system should include specific plans to increase resource mobilization and enhance resource allocation. A strong resource-mobilization plan will maximize the amount of public and private funding that can be derived from various sources, while sound resource-allocation plan will define mechanisms to distribute those resources in a manner that encourages and rewards performance. Given the government's tight fiscal constraints, it is unlikely that the authorities will be able to significantly increase public spending on tertiary education. Consequently, the government will need to explore other financing options to achieve its goals for expanded enrollment and enhanced education quality in both the university and non-university subsectors.

146. Establishing PPPs could enable the authorities to mobilize additional resources from the private sector. The Zimbabwean government has already begun to explore the possibility of using PPPs to complement public investment in tertiary education. PPPs have proven to be an especially effective mechanism for building university infrastructure, such as dormitories and cafeterias.

147. Improving the efficiency of publicly funded education programs and institutions is another way to maximize the impact of a limited budgetary envelope. While data limitations prevent a thorough analysis of the internal efficiency of public universities

and TVET institutions, creating effective retention programs that reduce the country's high dropout rates would likely generate substantial fiscal savings.

148. Boosting own-source revenue mobilization among tertiary education institutions could augment the government's limited resources. While tuition fees in Zimbabwe are already high by the standards of comparable countries, Zimbabwean universities have considerable scope to raise resources through donations, contract research, consultancies, continuing education, and similar activities. Many institutions began experimenting with alternative revenue strategies during the economic crisis, and further efforts in this area could both expand and diversify their revenue base. Annex 1 describes the international experience with own-source revenue generation among tertiary education institutions.

149. The international experience suggests that providing continuing education, undertaking productive activities, and raising funds from alumni and corporations are universities' three most important non-tuition revenue streams. Globally, some research universities have generated significant revenue from licensing technological innovations for commercial use. However, even in countries that have favorable policy frameworks for innovation, patenting, and commercialization, very few institutions create path-breaking technologies that can be successfully licensed. Even at Harvard University, income from licensed technologies US$10 million per year), represents just 1 percent of Harvard's annual fundraising receipts.

150. While Zimbabwe does not have a well-established culture of educational philanthropy, the international experience shows that even universities in middle-income countries can find donors, both locally and among the diaspora, who will make sizeable financial contributions if they are presented with a compelling rationale. Moreover, the experience of European universities reveals that overcoming cultural obstacles may be easier than it initially appears. European universities' experience with cultivating donations yields three key lessons: (i) the prestige and reputation of universities are regarded proxies of their quality, (ii) an effective fundraising strategy requires maintaining continuous relationships with different types of donors, and (iii) the institution's political context influences its fundraising capabilities (Box 11).

BOX 11 LESSONS LEARNED FROM UNIVERSITY FUNDRAISING EFFORTS IN EUROPE

A 2011 European Commission survey on fundraising efforts among European universities found that success hinged on three factors: (i) the university's endowment, academic reputation, and preexisting relationships with potential donors; (ii) the commitment of its staff and leadership to successful fundraising; and (iii) its political context and physical location. The survey also revealed that European universities raise money primarily from private corporations rather than alumni contributions. The experience of European universities indicates that successful fundraising requires:

- The commitment of the university's management and governing body;
- The full participation of academic staff;
- The investment of financial and human resources in fundraising activities;
- Rewards for staff who successfully solicit donations;
- The quality of fundraising materials and online platforms;
- The use of a database to maintain updated records on donor interactions; and
- The inclusion of donations in universities' annual financial reports.

The United Kingdom implemented one of Europe's most successful fundraising strategies. The government created a fund-matching scheme based on similar programs in the Canadian province of Alberta, the U.S. state of Florida, Hong Kong, and Singapore. Between 2008 and 2011, the British government matched any eligible gift made to a participating tertiary education institution. While South Africa may lack the resources to establish a similar matching program, the government should not penalize fundraising by reducing public transfers to universities that successfully generate their own revenue.

Sources: European Commission, 2011; Universities UK, 2008

151. The government should not penalize public institutions that prove successful at raising own-source revenue by reducing their budget allocations or by requiring them to transfer to the public treasury any surplus funds raised from private sources. These policies undermine incentives for universities to generate non-tuition revenue. By contrast, positive incentives such as matching grants can encourage universities to proactively seek donations. In the Canadian province of Alberta, the government introduced a matching-grant program in 2006 that was so successful that philanthropic donations to universities exceeded the public funds set aside for co-financing.[41]

152. Tax deductions can also encourage firms and individuals to donate to tertiary education institutions. The United States, Canada, Hong Kong, the United Kingdom, and many European countries offer generous tax incentives to encourage university donations. In Latin America, Brazil, Colombia, and Chile offer income-tax deductions for university donations. Among developing countries, India has one of the most generous tax-incentive schemes, which fully exempts all individual and corporate donations to universities from taxation.[42]

Guiding Principles for a Sound Financing System

153. Based on the lessons arising from analyzing the evolution of funding mechanisms in OECD countries in the past decade, an adequate model for allocating public funds for higher education in Zimbabwe would be well served by applying the following eight principles. These are: (i) closely aligning education funding levels with national priorities; (ii) explicitly linking funding to performance; (iii) improving equity across income levels and demographic groups; (iv) ensuring transparency in the allocation criteria; (v) achieving consistency and compatibility among the various financing instruments; (vi) maintaining stable funding levels over time; (vii) promoting institutional autonomy and accountability; and (viii) allocating funding primarily through block grants. Each of these principles is discussed in detail below:

- *Alignment with National Priorities*. Tertiary education funding mechanisms should be fully consistent with the government's policy goals and long-term vision for the tertiary education sector. Public funds provided without a clear strategic orientation will not efficiently advance national objectives, while a tertiary education strategy that lacks appropriate financial resources and incentives is unlikely to reach fruition.

- *Performance Orientation*. The international experience reveals that tying the distribution of funding to measures of institutional and/or student performance can significantly improve the ability of education systems to achieve policy objectives. Key dimensions of performance include indicators of access and equity, quality and relevance, research production and knowledge transfer, and efficiency in the use of public resources.

- *Equity in Resource Allocation*. The distribution of public resources should be broadly equitable across income levels and demographic groups. All South African citizens should have equal access to the benefits of public education funding.

- *Transparency in Resource Allocation*. The rules and criteria for allocating public funds to the tertiary education sector should be clearly defined and fully transparent. The results of each round of funding allocation should be made publicly available in a timely manner.

- *Consistent Financing Instruments*. No single funding mechanism can satisfy all the government's policy objectives. The multiple instruments used to advance these objectives must be complementary, consistent, and mutually reinforcing.

- *Stable Funding Levels*. Multiyear budget mechanisms allow tertiary education institutions to implement medium- and long-term development initiatives by reducing the risk of funding shortfalls. A long-term perspective is essential to infrastructure investment and staff recruitment, both of which entail continuing financial obligations.

- *Institutional Autonomy and Accountability*. The international experience shows that autonomous universities are more able to innovate and respond to rapidly changing external conditions and evolving labor-market needs. However, all institutions and students that receive government subsidies should be fully accountable for the appropriate use of public resources through independent audit mechanisms and clear performance indicators.

- *Block-Grant Allocation.* Rather than organizing the budget into rigidly defined line items, the government should continue to tertiary education funding via non-earmarked block grants. Greater flexibility in planning and deploying their resources enhances the autonomy and responsiveness of tertiary education institutions.

154. Zimbabwe's current funding framework is only partially aligned with these principles. Reorienting funding to incentivize performance, increasing budgetary stability and predictability, utilizing a range of financing instruments that reflect the primary mission of each type of institution, and allocating resources in the form of block grants could bring the system closer to conformity with international best practices (Table 10).

TABLE 13 THE ALIGNMENT OF ZIMBABWE'S TERTIARY EDUCATION FINANCING FRAMEWORK WITH INTERNATIONAL GOOD-PRACTICE PRINCIPLES

Guiding Principles	Alignment with Zimbabwe's Financing Model	Comments
Alignment with national priorities	+	No direct relationship
Performance orientation	+	No performance criteria
Equity considerations	+	Limited student loans provided through EduLoan
Multiple financing instruments	+	Only direct budgetary contributions
Objectivity and transparency	+	Limited transparency
Stability over time	+	No guarantee of stability and no multiyear budget
Block grant allocation	+	Already in place
Institutional autonomy and accountability	++	Incomplete

Note: "+" indicates weak alignment; "++" indicates average/reasonable alignment; "+++" indicates full alignment

Strengthening Zimbabwe's Tertiary Education Funding System

155. To promote the efficient use of public resources, the government could introduce performance-based budget mechanisms designed to align the financial incentives of institutions with national policy goals.[43] The government could leverage three mechanisms, 91 either separately or together, to improve public expenditure efficiency in the tertiary education sector: (i) funding formulas; (ii) performance-based grants; and (iii) competitive grants.

Funding Formulas

156. Allocating resources to educational institutions according to a transparent formula that reflects performance indicators can sharpen efficiency incentives. Moreover, these funding formulas can be weighted according to the relative priority of various educational outputs and outcomes, such as the number of graduates, the employment rate of graduates, or the number of published research papers.

157. Several OECD countries have incorporated performance indicators into their funding formulas for tertiary education. Denmark has adopted a "taxi meter model" under which 30 to 50 percent of recurrent funding is determined by the number of students who successfully pass exams every academic year. Similarly, in the Netherlands, half of recurrent funding is based on the number of degrees awarded each year. In Australia, funding for doctoral student places is based on a formula comprising graduates (40 percent), research output (10 percent), and research income, including competitive grant awards (50 percent).

Performance-Based Contracts

158. Performance-based contracts are nonbinding regulatory agreements negotiated between

governments and tertiary education institutions that define a set of mutual obligations. In return for the participating universities' commitment to meeting the performance targets established in the agreement, the government provides them with additional funding. Performance agreements may be signed with one, several, or all institutions in the tertiary education system; some or all of each institution's funding may be tied to the requirements in the contracts; and funding can be provided when the contract is signed or after performance has been verified.

159. Numerous countries and subnational jurisdictions have implemented performance-based contracts in their tertiary education sectors. As part of a pilot program in Chile in the late 2000s, four public universities volunteered to receive additional resources in exchange for implementing a carefully negotiated institutional improvement plan with clear progress and outcome indicators. Following a positive evaluation, the program was expanded to a large number of public and private universities. With support from the World Bank, Costa Rica has used performance contracts to promote the transformation of four of its five public universities. This represents the first time that the government has attempted to use performance incentives to influence the behavior of public universities, which traditionally received their budget directly from the Ministry of Finance as a set percentage of the national budget. Denmark uses performance-based contracts with long-term institutional goals, while Finland's contracts set both specific goals for each institution and general goals for the entire tertiary education system. France has allocated about one-third of its recurrent tertiary education budget through four-year performance contracts since 1989. Payments are made when the contracts are signed, and ex post evaluations assess their implementation. Finally, the U.S. states of Louisiana, Maryland, Michigan, North Dakota, South Carolina, Tennessee, and Virginia use various performance-based contracts for their tertiary education institutions.

160. Performance-based contracts encourage institutions to improve their results on a voluntary basis, removing the need for central directives that may or may not be followed. From the government's perspective, a key advantage of performance-based contracts is that they align the behavior of tertiary education institutions with national policy objectives. From the perspective of the institutions, performance-based contracts offer additional resources to implement strategic plans that reflect each institution's self-defined priorities.

161. The success of performance-based contracts depends on two factors. First, the negotiation of the performance agreement must involve a neutral party tasked with facilitating open dialogue between the government and the university leadership. In Chile, former university vice-chancellors often serve in that role. Second, the relevant government agency—in this case the DHET—must devote sufficient financial and human resources to monitor the implementation of the performance-based contracts.

Competitive Funds

162. Competitive funds have proven to be an effective and flexible means of financing transformative investment in tertiary education. Under this mechanism, institutions are invited to formulate project proposals that are reviewed and selected by committees of peers according to transparent procedures and criteria. The features of competitive funds vary from country to country based on the specific policy changes targeted. In Argentina and Indonesia, for instance, proposals may be submitted by entire universities, by departments, or by individual faculty members. In Chile, both public and private institutions may compete for funds. In Egypt, a competitive fund was established in the 1990s specifically to stimulate reforms in engineering education. Positive experiences in countries as diverse as Chile, China, Egypt, Indonesia, and Tunisia (Box 12) have demonstrated the ability of competitive funds to improve the quality and relevance of tertiary education, promote pedagogical innovations, and improve management—objectives that can be difficult to achieve through funding formulas or performance-based contracts alone. In Zimbabwe, piloting a competitive fund could complement the government's broader effort to improve the performance of tertiary education institutions.

BOX 12 THE INTERNATIONAL EXPERIENCE WITH COMPETITIVE FUNDS FOR TERTIARY EDUCATION

Well-designed competitive funds can be powerful vehicles for institutional innovation and transformation. The World Bank supported one of the first competitive funds, Argentina's Quality Improvement Fund (FOMEC), which was instrumental in promoting strategic planning among tertiary education institutions. Within universities, academic departments that had never previously worked together began collaborating on the design and implementation of joint projects. In Egypt, the Engineering Education Fund helped introduce the notion of competitive bidding and peer evaluation in the allocation of public investment resources. The fund effectively promoted the transformation of traditional engineering degrees into applied programs with close ties to industry. In Chile, a competitive fund for diversification supported the development of technical institution in the non-university subsector, as well as qualitative improvements in all public universities. Competitive funding mechanisms in Brazil, Mexico, and Uganda have encouraged investment in science and technology programs. The participation of international peer-review experts has figured prominently in all cases.

Countries that have a diversified tertiary education system marked by unequally developed types of institutions may consider offering multiple financing mechanisms based on different criteria or establishing compensatory funds to create a level playing field between stronger and weaker institutions. A World Bank-supported project in Indonesia in the 1990s created three different funding mechanisms designed to serve universities according to their institutional capacity. In the last tertiary education project financed by the World Bank in China in the early 2000s, each the country's top universities was required to form a partnership with a university in a poorer province as a condition for competing. In Egypt, the competitive fund used by the Engineering Education Reform project in the late 1980s included a special mechanism that provided technical assistance to help less-experienced engineering schools prepare strong funding proposals. In Chile, a special mechanism was created for universities that required assistance in strategic planning and project design.

Source: World Bank, 2002

163. Competitive funds can promote budgetary transparency by establishing clear criteria and procedures for allocating funds, verified by an independent monitoring committee. An additional benefit of competitive funding mechanisms is that they encourage universities to undertake strategic planning based on a sound assessment of their needs and priorities.

Adopting a Three-Pillar Funding Model

164. Tertiary education institutions require multiple financing mechanisms that reflect their diverse missions and development strategies. Relying on a single financing mechanism prevents policymakers from adjusting individual funding streams to reflect performance on different priorities, such as graduation rates or scholarly output. An increasing number of OECD countries, especially in Europe, have begun adopting a three-pillar funding model that allocates resources in different ways depending on the purpose of the funding.

165. The three-pillar funding model ties different institutional priorities to dedicated financing streams. Under the first pillar, core funding is provided though a block grant, the size of which is determined by an input-based formula. This pillar provides near-term financial stability. Under the second pillar, performance-based funding is provided through an output-based formula or performance agreement. This pillar links current funding directly to past performance. Under the third pillar, innovation-oriented funding is provided though competitive grants or performance agreements. This pillar encourages the use of strategic planning to improve future performance.[44] Countries that have adopted a three-pillar model, such as Finland, generally allocate 70 to 80 percent of the total tertiary education budget through pillar one, 10 to 20 percent through pillar two, and up to 10 percent through pillar three.

Matrix of Policy Options

166. Tertiary education reform is a complex process that requires a carefully sequenced and prioritized agenda. Table 8 and Table 9 summarize the policy options presented throughout this section. Table 8 categorizes each option as either short term, medium term, or long term based on their urgency and implementation duration. Table 9 assesses the relative difficulty involved in implementing each policy option given its technical complexity, financial cost, and political sensitivity.

TABLE 14 SEQUENCING OF POLICY OPTIONS

Policy Measures	Short-Term	Medium-Term	Long-Term
G. Vision Setting			
Formulation of detailed vison and strategic plan	✔		
Implementation of strategic plan		✔	✔
Mobilization of resources needed to implement plan	✔	✔	
H. Expansion through Institutional Diversification			
Analysis of TVET colleges	✔		
Development of strategy for upgrading TVET colleges	✔		
Upgrading of TVET colleges		✔	
Assessment of Zimbabwe Open University (ZOU) performance and challenges	✔		
Formulation of strategic plan to expand ZOU	✔		
Implementation of ZOU strategic plan		✔	
Identification of barriers to development of private tertiary education sector	✔		
Simplification of regulatory requirements	✔		
Financial incentives for accredited private institutions			✔
I. Improving Education Quality and Relevance			
Secondary Education			
Improvements in quality of secondary education			✔
Secondary & Tertiary Education			
Training of academic counselors	✔		
Development of academic counselling in secondary schools and tertiary institutions		✔	✔
Creation of secondary/tertiary outreach and bridge programs		✔	✔
Tertiary Education			
Design of system to identify at-risk tertiary students	✔		
Design of foundation program	✔		
Operation of foundation program		✔	
Operation of retention programs encompassing academic, psychological and financial support		✔	✔
Elaboration of training plan for academics	✔		
Implementation of training plan for academics		✔	✔
Establishment of teaching and learning services unit	✔		

Policy Measures	Short-Term	Medium-Term	Long-Term
Implementation of curricular and pedagogical innovations		✔	
Improving Relevance			
Participation of industry professionals in institutional curriculum committees	✔	✔	✔
Expansion of student internships	✔	✔	
Expansion of private-sector consultancy and research contracts	✔	✔	
Consolidating Quality-Assurance Mechanisms			
Alignment of quality-assurance mechanisms with international best practices	✔	✔	
Establishment or consolidation of institutions' internal quality-assurance units	✔	✔	
J. Enhancing Research Capabilities			
Development of national science and technology policy	✔	✔	
Review of research funding organizations and methodology	✔		
Increased research funding under new methodology		✔	✔
Provision of incentives for female researchers	✔	✔	
Provision of incentives for promising young researchers at research-intensive universities	✔	✔	
Creation of specialized research teams at research-intensive universities		✔	✔
K. Improving Governance			
Design of unified tertiary education system	✔	✔	
Designation of MHTESTD as lead agency in the tertiary sector	✔	✔	
Design of information-management system for tertiary education by MHTESTD	✔	✔	
Implementation of information-management system for tertiary education by MHTESTD		✔	
Assessment of institutional autonomy	✔		
Implementation of reforms increasing autonomy and accountability among tertiary education institutions		✔	
L. Financial Sustainability			
Definition of terms of public-private partnerships by MHTESTD	✔		
Resource mobilization through public-private partnerships		✔	✔
Definition of targeted free tuition policy by MHTESTD and the Treasury	✔		
Implementation of targeted free tuition policy		✔	
Design of student loan scheme	✔	✔	
Implementation of student loan scheme		✔	✔
Design of performance-based financial allocation mechanism by MHTESTD	✔ ✔		
Implementation of performance-based allocation mechanism		✔	
Income diversification by tertiary education institutions	✔	✔	

TABLE 15 IMPLEMENTATION DIFFICULTY OF POLICY OPTIONS

Policy Measure	Technical Complexity	Financial Cost	Political Sensitivity
G. Vision Setting			
Formulation of detailed vison and strategic plan	++	-	++
Implementation of strategic plan	+++	+++	+
Mobilization of resources needed to implement plan	++	+++	++
H. Expansion through Institutional Diversification			
Analysis of TVET colleges	++	+	-
Development of strategy for upgrading TVET colleges	++	+	-
Upgrading of TVET colleges	++	++	-
Assessment of Zimbabwe Open University (ZOU) performance and challenges	+	+	-
Formulation of strategic plan to expand ZOU	++	+	-
Implementation of ZOU strategic plan	++	+	+
Identification of barriers to development of private tertiary education sector	++	+	-
Simplification of regulatory requirements	+	-	+
Financial incentives for accredited private institutions	+	+	+
I. Improving Education Quality and Relevance			
Improvements in quality of secondary education	++	++	-
Training of academic counselors	+	+	-
Development of academic counselling in secondary schools and tertiary institutions	+	+	-
Creation of secondary/tertiary outreach and bridge programs	+	-	-
Design of system to identify at-risk tertiary students	++	+	+
Design of foundation program	++	+	-
Operation of foundation program	+	+	-
Operation of retention programs encompassing academic, psychological and financial support	++	+	+ -
Elaboration of training plan for academics	+	+	-
Implementation of training plan for academics	+	+++	+
Establishment of teaching and learning services unit	++	+	++
Implementation of curricular and pedagogical innovations	++	+	-
Participation of industry professionals in institutional curriculum committees	+	-	
Expansion of student internships	+	+	-
Expansion of private-sector consultancy and research contracts	+	-	-

Policy Measure	Technical Complexity	Financial Cost	Political Sensitivity
J. Enhancing Research Capabilities			
Development of national science and technology policy	++	-	+
Review of research funding organizations and methodology	+	-	++
Increased research funding under new methodology	+	+++	-
Provision of incentives for female researchers	+	++	-
Provision of incentives for promising young researchers at research-intensive universities	+	+	+
Creation of specialized research teams at r esearch-intensive universities	++	++	+
K. Improving Governance			
Design of unified tertiary education system	++	-	++
Designation of MHTESTD as lead agency in the tertiary sector	+	-	+
Design of information-management system for tertiary education by MHTESTD	+	+	-
Implementation of information-management system for tertiary education by MHTESTD	+	+	+
Assessment of institutional autonomy	+	-	+
Implementation of reforms increasing autonomy and accountability among tertiary education institutions	++	-	++
L. Financial Sustainability			
Definition of terms of public-private partnerships by MHTESTD	++	-	-
Resource mobilization through public-private partnerships	+	+	+
Definition of targeted free tuition policy by MHTESTD and the Treasury	++	-	+
Implementation of targeted free tuition policy	++	+++	+
Design of student loan scheme	+++	-	-
Implementation of student loan scheme	++	++	+
Design of performance-based financial allocation mechanism by MHTESTD	++	-	+
Implementation of performance-based allocation mechanism	++	+	++
Income diversification by tertiary education institutions	+	-	-

Note: (-)neutral; (+) low; (++) medium; (+++) high

Summary

After many years of crisis during which Zimbabwe's tertiary sector has suffered from a lack of strategic planning, a comprehensive approach is needed to revitalize the post-secondary education system. The most urgent priority for revitalizing the sector, therefore, is to elaborate a bold vision for its development. Considering Zimbabwe's low level of tertiary enrollment, the dominant position of public universities in the tertiary sector, and the government's limited resources, policymakers may wish to consider an expansion strategy based on

institutional differentiation (growth of the non-university sub-sector, expansion of online education, and development of the private sector). Equity-promotion policies—with both financial and non-monetary measures—could complement institutional differentiation by reducing disparities in access to and success in tertiary education.

Improving the quality and relevance of tertiary education in Zimbabwe will require a combination of interventions. These interventions should target four key determinants of education quality and relevance: (i) better preparation of incoming students; (ii) higher qualifications of academics; (iii) innovative curricular and pedagogical practices; and (iv) closer links to the productive sectors.

To build the research capacity of Zimbabwe's top universities, the government must: (i) articulate a clear science and technology strategy, and (ii) increase public funding for research. At the institutional level, each university interested in raising its research capacity must be able to attract and retain a mix of young, promising researchers and older, more experienced researchers.

Modernizing the administration of the tertiary education sector will require reforms under three strategic axes: (i) reforming the sector's administrative framework; (ii) increasing the autonomy of tertiary institutions; and (iii) ensuring that those institutions are fully accountable for their academic performance and use of public resources.

A sustainable financing strategy for the Zimbabwean tertiary education system should include specific plans to increase resource mobilization and enhance resource allocation in ways that reward performance. Improving the efficiency of publicly funded education programs and institutions is another way of maximizing the impact of a limited budgetary envelope. Boosting own-source revenue mobilization among tertiary education institutions could effectively complement the government's limited resources. To promote the efficient use of public resources, the government could introduce performance-based budget mechanisms designed to align the financial incentives of institutions with national policy goals, such an output-based funding formula, performance contracts, and/or a competitive fund.

06 CONCLUSION

167. To revitalize tertiary education and maximize its contribution to Zimbabwe's economic recovery, the government will need to implement extensive reforms to the sector's policy, administrative, and institutional frameworks. Though Zimbabwe faces considerable challenges, its emergence from the recent crisis presents a unique opportunity to craft a bold new strategic agenda for the tertiary education sector and to implement critical policy changes that might otherwise be thwarted by vested interests. The MHTESTD should seize this opportunity to translate the Education 5.0 vision into a concrete set of reforms, programs, and projects backed by a sustainable financing strategy and appropriate implementation arrangements.

168. Zimbabwe's extensive developmental needs and difficult economic circumstances underscore the importance of coordination among its external development partners. Several of Zimbabwe's external partners are willing to support the revitalization of the tertiary education sector, and some have already begun providing financial and technical assistance. Coordination will be vital to ensure that external support reflects the government's priorities and that the various donor-supported programs and projects are mutually consistent and complementary. In this context, the MHTESTD has a critical role to play in aligning donor initiatives around a clear strategic vision and credible action plan.

169. Along with effective coordination, the proper sequencing of the reform agenda can play a major role in its success. Incremental changes may encounter only modest opposition compared to an abrupt transformation of the status quo. Delaying controversial actions can afford policymakers time to lay the necessary institutional groundwork and build consensus. However, an excessive delay can also give interest groups an opportunity to mobilize against unpopular but necessary reforms. The authorities must carefully consider these tradeoffs when determining the sequence of the reform agenda.

170. While the recent crisis has created an opportunity to implement deep reforms in the tertiary sector, some measures will inevitably encounter opposition from vested interests. The success of the government's tertiary education strategy will hinge on its ability to effectively address the political sensitivity of the reform agenda and manage potential conflicts between stakeholders. Policymakers will need to engage with a diverse array of interests, both within and outside the tertiary education sector, and build consensus around a shared strategic vision. An ex ante assessment of key stakeholders could enable the authorities to identify potential sources of opposition, as well as prospective champions for the reform agenda, and an inclusive consultation process could help the authorities proactively address stakeholder concerns. Channeling additional resources to the sector could further bolster support for the government's plan and facilitate the reallocation of funds across interest groups.

171. Reforming Zimbabwe's tertiary education sector is a challenging endeavor, and a clear action plan will be crucial to achieve the government's policy objectives. International experience shows that success is most likely when policymakers thoroughly assess the prevailing social and political circumstances, build a consensus among key stakeholders, properly sequence the implementation of the reform agenda, and mobilize additional resources to bolster support and mollify opposition. Meeting these conditions requires a detailed strategy and action plan, which must reflect the government's self-defined priorities for the future of the tertiary education sector.

172. Looking ahead, the Government of Zimbabwe

may want to consider additional work to address the following key issues, which will facilitate implementation of the vision and reform agenda: (i) construction of a labor market information system; (ii) integration of higher education and tertiary education into a unified but differentiated system with clear articulation mechanisms and pathways; and (iii) sustainable financing strategy. In the first instance, establishing a comprehensive labor market observatory would provide all stakeholders (government, employers, tertiary education institutions, students, parents) with reliable and up-to-date information on the labor market results of graduates. This information is indispensable for academic and career guidance purposes; it is also useful as feedback on the quality and relevance of tertiary education programs from the viewpoint of employers to guide curriculum development activities.

173. Integration of the higher education and tertiary education sub-sectors into a single, differentiated system would have the advantage of increasing opportunities for further education and lifelong learning. Rather than perpetuating the segmentation between first-tier institutions with more prestige and second-tier institutions that are not well regarded, this reform would allow all providers could seek to be excellent at offering the types of programs that correspond to their specific institutional mission in a differentiated system.

174. Finally, implementing financial reforms towards the construction of a sustainable funding system will require long-term efforts to carefully design, test and evaluate the various measures under consideration. Proper sequencing of the reforms will also be important.

NOTES

1. The Webometrics Ranking of World Universities, also known as Ranking Web of Universities, is a ranking system for the world's universities based on a composite indicator that takes into account both the volume of the Web contents (number of web pages and files) and the visibility and impact of these web publications according to the number of external links (site citations) they received. http://www.webometrics.info/en

2. Various members of the World Bank team visited a small sample of public and private universities, including the University of Zimbabwe. In each case, the team met with the vice chancellor and members of the leadership teams, as well as with deans and professors in a wide range of disciplines.

3. World Bank, 2019.

4. Ibid. p.6.

5. Ibid. p.13.

6. WEF, 2017.

7. Ibid. p. iii.

8. The conceptual framework behind these questions was developed by the World Bank in the context of a wider policy research project focused on measuring educational outcomes (SABER). A summary of the framework for tertiary education can be found in Salmi (2013).

9. Government of Zimbabwe, 2017. "Labour Market Outlook."

10. IOM and ZIMSTAT, 2016. "Migration in Zimbabwe: A Country Profile 2010–2016."

11. Government of Zimbabwe, 2018. "Vision 2030."

12. World Bank, 2014. "World Development Indicators."

13. Adopted from the Joint Needs Assessment for Zimbabwe – Synthesis Report 2019

14. The terms "hot seating" or "double sessions" refers to a situation in which a single school holds sessions for two different sets of students each day, one in the morning and one in the afternoon. While these sessions use the same classrooms, they typically have different teachers.

15. The ICT in Education policy was developed with support from the World Bank.

16. Source: Zimdef website

17. UNFPA County Profile – Young People

18. The OECD elaborated tests to measure the acquisition of generic competencies and professional skills in the areas of economics and engineering, which were piloted in 2012 in the context of the AHELO project (Assessment of Higher Education Learning Outcomes). In the United States, a growing number of institutions have been using one of three assessment instruments to measure added value at the undergraduate level: the ACT Collegiate Assessment of Academic Proficiency (CAAP), the ETS Proficiency Profile (EPP) and the Collegiate Learning Assessment (CLA). Similar instruments have been applied in other OECD countries, such as Australia's Graduate Skills Assessment. A few Latin American countries—Brazil, Colombia and Mexico—have also been pioneers in that respect, as Jordan has been in the Middle East.

19. The Webometrics Ranking of World Universities, also known as Ranking Web of Universities, is a ranking system for the world's universities based on a composite indicator that takes into account both the volume of the Web contents (number of web pages and files) and the visibility and impact of these web publications according to the number of external links (site citations) they received. http://www.webometrics.info/en

20. Various members of the World Bank team visited a small sample of public and private universities, including the University of Zimbabwe. In each case, the team met with the vice chancellor and members of the leadership teams, as well as with deans and professors in a wide range of disciplines.

21. The H-index is a bibliometric index developed in 2005 by Professor Jorge Hirsch, a University of California physicist. A researcher's H-index score is the maximum number of publications for which each publication is cited at least that many times. The index is based on the researcher's most-cited papers and the number of citations that they have received in other publications. The H-index is superior to many other bibliometric measures in that it considers both productivity and impact, is not biased by a small number of very successful articles, discounts the value of papers that are not influential, and uses only publicly available data (Usher, 2012).

22. https://www.natureindex.com/supplements/nature-index-2016-rising-stars/index#ni-articles

23. https://www.natureindex.com/supplements/nature-index-2016-rising-stars/tables/africa

24. 24 The 2017 Clarivate Analytics list of highly cited researchers encompasses 21 academic disciplines and evaluates journals indexed in the Web of Science Core Collection during the 2005-2015 period. "Highly cited papers" are those that rank in the top 1 percent of citations for their discipline and publication year.

25. These figures are from the government's official budget document, the "Blue Book."

26. World Bank, 2010.

27. heritage-based approach means building on indigenous knowledge systems in the promotion of science and technology and leveraging on the country's natural resources to strengthen science and technology through advanced technologies in mining etc.

28. Salmi, 2017

29. Malee Bassett and Salmi, 2014.

30. 30 Salmi, 2017.

31. Ekowo and Palmer, 2016.

32. Woolley and Malone, 2011; Page, 2008.

33. This definition is provided by the National Commission for Cooperative Education (NCCE), which is dedicated to advancing cooperative education throughout the United States. See: http://www.co-op.edu/aboutcoop2.html

34. StudyinCanada.com. "University of Waterloo". See: http://www.studyincanada.com/english/schools/profile.asp?SchoolCode=uwatl08&ProfileType=University&URL=index

35. University of Waterloo, Canada. "Co-op at Waterloo" (http://findoutmore.uwaterloo.ca/coop/)

36. Salmi and Hauptmann, 2006; Salmi, 2015.

37. Salmi, 2013b. In Ireland and the United Kingdom, university councils choose their own external members to avoid political interference.

38. Fielden, 2008; Salmi, 2013b.

39. http://teqipgoodgovernance.in/TEQIP%20GOOD%20PRACTICE%20GUIDE%20FOR%20GOVERNING%20BODIES_DEC%202012.pdf

40. OECD, 2007; Salmi, 2013.

41. Tetley, 2006.

42. World Bank, 2002.

43. OECD (2007); Salmi and Hauptman (2006).

44. See Kivistö (2015).

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p18, World Bank

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ANNEXES

ANNEX 1

ANNEX 1 RESOURCE DIVERSIFICATION MATRIX

Category of income	Source of income				
	Government	Students & families	Industry & services	Alumni / philanthropists	International cooperation
Budgetary contribution					
General budget	x				
Dedicated taxes (lottery, tax on liquor sales, tax on contracts, tax on export duties)	x				
Payroll tax			x		
Fees for instructional activities					
Tuition fees					
Degree / non-degree programs		x	x		
On-campus / distance education programs		x	x		
Advance payments		x			
Chargeback	x				
Other fees (registration, labs, remote labs)		x			
Affiliation fees (colleges)			x		
Productive activities					
Sale of services					
Consulting	x		x		x
Research	x		x	x	x
Laboratory tests	x		x		
Patent royalties, share of spin-off profits, monetized patent royalties deal			x	x	
Operation of service enterprises (television, hotel, retirement homes, malls, parking, driving school,			x		
Internet provider, gym)			x		
Financial products (endowment funds, shares)			x		
Production of goods (agricultural and industrial)		x	x	x	
Themed merchandises and services (smart card)	x	x	x	x	x
Rental of facilities (land, classrooms, dormitories, laboratories, ballrooms, drive-through, concert halls, mortuary space, movie shooting)			x	x	
Sale of assets (land, residential housing, art treasures)					
Fund raising					
Direct donations					
Monetary grants (immediate, deferred)			x	x	x
Equipment			x	x	
Land and buildings	x			x	

Category of income	Source of income				
	Government	Students & families	Industry & services	Alumni / philanthropists	International cooperation
Scholarships and student loans	x		x	x	x
Endowed chairs, libraries, mascot			x	x	
Challenging / matching grants		x	x	x	
Religious donations ("Zakat")		x		x	
Indirect donations (credit card, percentage of gas sales, percentage of stock exchange trade, lectures by alumni)			x		
Tied donations (access to patents, share of spin-off profits)			x		
Concessions, franchising, licensing, sponsorships, partnerships (products sold on campus, names, concerts, museum showings, athletic events)		x	x		
Lotteries and auctions (scholarships)					
Loans					
Regular bank loans	x		x		x
Bond issues (regular and social impact)		x	x	x	

Source: Compiled by Jamil Salmi

ANNEX 2

ANNEX 2 RESOURCE DIVERSIFICATION MATRIX

University		Enrollment	Graduation	Staffing	Financing	Dropout	Examination	Facility	R&D
University of Zimbabwe (UZ)	Public	+++	+++	+++	+++	+++		+++	+
Bindura University of Science Education (BUSE)	Public								
Chinhoyi University of Technology (CUT)	Public	+++	+++	+++	+++	+++		+++	+++
Midlands State University (MSU)	Public	+++	+++	+++	+++	+++	+++		+++
Great Zimbabwe University (GZU)	Public	+++	+++	+++	+++			+++	
Harare Institute of Technology (HIT)	Public	+++	+++	+++	+++	+++	+++		
Marondera University of Agricultura Science & Technology (MUAST)	Public	+++						+	
Manicaland State University (MASU)	Public								
Arupe Jesuit University (APJ)	Private								
Reformed Church University (RCU)	Private								
National University of Science & Technology (NUST)	Public	+++	+++	+++	+++	+++			+++
Lupane State University (LSU)	Public	+++	+++	+++	+++	+++	+++	+++	
Africa University (AU)	Private								
Solusi University (SU)	Private								
Women's University in Africa (WUA)	Public								
Zimbabwe Open University (ZOU)	Public	+++	+++	+++	+++	+++	+++	+++	+++
Gwanda State University (GSU)	Public								
National Defense University (NDU)	Military								
Catholic University in Zimbabwe (CUZ)	Private	+++	+++	+++	+++	+++			
Zimbabwe Ezekiel Guti University (ZEGU)	Private	+++	+++	+++	+++	+++	+++	+++	
Arupe Jesuit University (APJ)	Private								
Reformed Church University (RCU)	Private								
Africa University (AU)	Private								
Solusi University (SU)	Private								
Women's University in Africa (WUA)	Private	+++	+++	+	+++	+++	+++	+++	

TVET institutions		Enrollment	Graduation	Staffing	Financing	Dropout	Examination	Facility	R&D
Gweru Polytechnical College	Public								
Mutare Polytechnical College	Public						+++		
Bulawayo Polytechnic	Public								
Kwekwe Polytechnical College	Public								
JM Nkomo Polytechnic	Public	+++		+++	+++		+++		
Harare Polytechnical College	Public								
Mutare Polytechnic School of Hotel & Tourism (SCHOTO)	Public						+++		
Msasa ITC	Public						+++		
St. Peter's Kubatana ITC	Private	+++	+++	+++	+++	+++	+++		

Teachers colleges		Enrollment	Graduation	Staffing	Financing	Dropout	Facility	R&D
Mkoba Teachers College	Public							
Masvingo Teachers College	Public							
Marymount Teachers College	Public							
Hillside Teachers College	Public	+++	+++	+++	+++	+++	+++	+++
Belvedere Teachers College	Public							
JM Nkomo College	Public	+		+++	+++		+++	
Morgan ZinTEc Teachers College	Public						+++	
Seke Teachers College	Public							
Morgenster Teachers College	Private							
Bondolfi Teachers College	Private						+++	
United College of Education	Private							
Madziwa Teachers College	Private							
Nyadire Teachers College	Private							

Note: (+) partly responded; (+++) fully responded

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