

(RESEARCH ARTICLE)



EFFECT OF BRAIN DRAIN ON THE QUALITY OF HIGHER EDUCATION IN ZIMBABWE'S STATE UNIVERSITIES

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Global Journal of Engineering and Technology Advances, 2026, 29(01), 181–195

Publication history: Received on 30 August 2026; revised on 06 October 2026; accepted on 08 October 2026

Article DOI: <https://doi.org/10.30574/gjeta.2026.29.1.0276>

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ABSTRACT

The considerable brain drain, the steady flow of skilled academic human capital to better resourced institutions and economies, remains a major challenge to the higher education sector in Sub-Saharan Africa, Zimbabwe's state universities are not spared of it. Previous case-study findings from two Zimbabwean universities and one faculty indicated that staff attrition was largely due to poor working conditions and low salaries. That investigation is taken a step further in this paper, which is a multi-institutional and multi-faculty study involving 157 current and former academic staff at 11 Zimbabwean state universities (151 after data-quality screening). The internal consistency of all measurement scales was good (Cronbach's alpha = 0.82-0.93). As demonstrated in the descriptive and inferential analysis (independent-samples t-test, one-way ANOVA, Pearson correlation, and multiple linear regression), there is no one factor that stands alone as the most important push factor, but rather a cluster of factors that are close together in terms of their perceived importance, with the most important factors being: limited career growth ($M = 3.06$), poor working conditions ($M = 3.05$), currency and macroeconomic instability ($M = 3.04$), and poor remuneration ($M = 3.03$). Perceived push-factor intensity was significantly different between the eleven institutions ($F = 1.93, p = .046$), but not significantly different between the eight faculties ($F = 1.13, p = .348$), which was not the case in the previous two-university case study. Career-growth- and governance-related causes (limited career growth, ineffective benefits application, corruption and nepotism) were the only significant predictors of perceived overall quality reduction in a regression model ($\beta = 0.495, p = .006, R\text{-squared} = .213$). The intensity of the push factor was significantly positively correlated with staff turnover intention ($r = .662, p < .001$), and organisational commitment was negatively correlated with staff turnover intention ($r = -.586, p < .001$). Of the 30 former staff that were surveyed, half transferred to academic institutions outside Africa and the most common reason for departure was poor remuneration (30%). Overall, institutional retention strategies were seen as moderately effective, and the more frequently a strategy was used the higher its effectiveness ratings ($r = .563, p < .001$). The results suggest a tailored, institution- and governance-specific solution to staff retention, and do not indicate a one-size-fits-all remedy for the sector, from which recommendations are drawn to be offered to the management of universities, the government and future researchers.

Keywords: Academic brain drain; Higher Education Quality; Faculty Retention; Push-Pull Migration Theory; Staff Turnover Intention; Zimbabwe State Universities.

1 INTRODUCTION

Academic staff are the main drivers of the teaching, research and community-development activities of a university, and the sustainability of a higher education system hinges on its capacity to attract and retain academic staff [11]. Where it fails to exist, the leakage of skilled manpower, known as 'brain drain' has long been identified as one of the more chronic problems in the quality of higher education in the developing world [1]. Sub-Saharan Africa has been particularly vulnerable: recent examination of continental migration patterns reveals that even if large numbers of people are migrating from Africa to other part of the continent in low-skilled roles, there is an increasing movement of highly educated professionals from Africa to Europe, North America and the Gulf, with whole professional cohorts, such as nurses in Ghana, now being more numerous outside of Africa than within the region where they were trained [1].

A parallel strand of literature indicates that these remittances that come in with the brain drain do not make up for the loss of human capital, and do not replace the institutional capacity that leaves with the academics [2]. This tension is evident in Zimbabwe's state university sector. The persistent vulnerability of Zimbabwean universities to staff losses is exacerbated by chronic macro-economic instability, currency volatility and straitened public sector budgets and coupled with relatively low salaries for academics. Studies have found that in Sub-Saharan Africa, public funding for higher education and research is as low as one percent of GDP, which is inadequate to develop internationally competitive universities and to keep the teachers and researchers that could make that happen [3].

Notwithstanding this pressure, Zimbabwe's policymakers have also been proactive in addressing it: the legislative reform in 2021 that placed academic staff into a Tertiary Education Service Commission, explicitly targeted towards expanding academic freedom, improving conditions of service and slowing the country's brain drain [4]; and the Heritage Based Education 5.0 policy, which aimed to propel universities into the future as drivers of innovation, industrialisation and community-rooted development [6]. Academic staff have also engaged in industrial action that has negatively impacted the sector, such as the long-running lecturers' strike at the University of Zimbabwe in 2025 that caused disruptions in examinations and attracted national attention regarding issues of salaries and conditions of service [7].

Even as the economy has started to stabilize, these disruptions have continued as annual inflation dropped from 736% in 2024 to 89% in 2025 with the real GDP growth turning positive in 2025 [8] indicating that the factors contributing to academic brain drain in Zimbabwe are not only macroeconomic but also organizational and governance related. A previous study on the phenomenon specifically within the Faculty of the Built Environment of two state universities in Zimbabwe (the National University of Science and Technology and the Midlands State University) revealed that poor working conditions and low pay were unanimously cited push factors and that brain drain was a key factor influencing postponement of examinations, hiring inadequately qualified replacement teaching staff and a general decrease of the quality of the universities. That study was with 40 targeted respondents in a single faculty in two institutions and did not address the issue of to what extent the results would be transferable to the broader state university system in Zimbabwe and to diverse faculties with a range of resource characteristics, such as those in science and engineering and in the humanities.

The assumption that this generalisation can be made is not warranted by comparative evidence from other parts of the continent: research conducted on universities in Nigeria and Ghana indicates that, the push factors and their intensity are very much different from one university to another and from one to another depending on the strength of local governance and industrial-relations practice [9] [10]. Against this backdrop, the present paper makes a significant extension of the original inquiry. The study reported here is based on data collected through a structured survey of the perceptions of 157 current and former academic staff members (151 after data-quality screening) from eleven state universities and eight faculties ranging from built environment, commerce, engineering, science and technology, health sciences, education, arts and social sciences to agriculture in Zimbabwe. This expanded range enables us to assess the causes, impacts and policy responses surrounding brain drain not only on a cumulative basis, but also on a comparative basis in terms of the institutional and faculty levels, the main value added of this paper compared to previous single site case studies.

The problem this paper addresses can be succinctly stated as follows: Zimbabwe's state universities are losing experienced academic staff to better resourced universities and economies, and this is widely reported, but little measured, to be compromising the quality of teaching, research and institutional development across the sector, with the extent and character of the problem likely to vary meaningfully from one university and one faculty to another. The objective of this study is thus to investigate the causes and consequences of academic brain drain on the quality of Higher education in a selected wide range of Zimbabwean State Universities and Faculties and to assess the measures

taken to address brain drain. The four aims of the study are: (a) to explore the push and pull factors explaining the migration of academic staff from Zimbabwean state universities; (b) to determine the perceived impact of brain drain on the quality of higher education, teaching, research output and institutional capacity; (c) to assess if the impact of academic staff migration on the quality of higher education, teaching, research output and institutional capacity varies among the institutions, faculties and academic staff demographic groups; and (d) to evaluate the level of utilisation and perceived effectiveness of the institutional strategies implemented to curb the migration of academic staff.

2 LITERATURE REVIEW

2.1 Conceptualising Brain Drain and Quality in Higher Education

The most popular definition of brain drain is the migration of highly skilled, well-educated people from a source country or institution to a destination that provides better salaries, working conditions or professional opportunities [13]. This definition in the higher education context is not limited to emigration, but also internal forms of attrition, such as those which happen when scarce expertise leaves academia to go to the private sector or to non-academic jobs, which also decrease the supply of expertise for academia. Quality in Higher Education, on the other hand, is defined broadly in terms of the realization of education goals, the excellence and the fitness for purpose of teaching and research processes and institutions. The two are linked most importantly in relation to the loss of the human capital (qualified/experienced academic staff) that has built up the reputation of the institution, which is the basis of its teaching and research work.

2.2 Theoretical Framework

The theoretical strand of this study is 3-fold. First, push-pull migration theory sees staff attrition as the result of adverse conditions in the sending institution (push factors – these include low pay, poor infrastructure, limited career prospects etc.) and favorable conditions elsewhere (pull factors – these include more money, better research funding, greater professional recognition etc.). Results of recent uses of the model in the field of higher education mobility also support the idea that host-country institutional, economic and social factors have a combined rather than separate influence on a would-be migrant's final decision to leave or stay [14] and are therefore correlated, as in this study. Second, according to Herzberg's two-factor theory of motivation, factors such as pay and working conditions are considered hygiene factors and their lack of improvement in the workplace can cause dissatisfaction and leave employees desiring to leave, whereas factors such as opportunity for advancement and recognition can be considered more of a motivator factor and their absence can cause dissatisfaction and a desire to leave, but not necessarily [16]. Third, the organisational commitment and turnover theory indicates that there is a relation between the affective commitment of the employee to an organization and his/her intention to quit the organization, such that high commitment to the organization is linked to a low level of turnover intention, and low commitment to the organization is linked to high turnover, which may be because of poor management-staff interaction and perceived unfairness [19] and [20]. A complementary way of thinking about how institutional retention strategies can, in principle, offset push factors is through the lens of Lewin's change model: organisational behaviour is a result of competing driving and restraining forces [17]. These frameworks drive the study's empirical design – push factors and pull factors were measured, as was job satisfaction, organisational commitment, and turnover intention – and enables the inter-relationships among these to be tested, rather than assumed.

2.3 Causes of Brain Drain in Higher Education Institutions

Although there are differences in the relative significance of each of the various factors that have determined academic attrition in developing-country universities, there is a considerable amount of recent literature that tends to agree on a set of push factors. A pay theme reoccurs: While studying Zimbabwean academics, it was found that not only salary is a proximate reason for intended departure, but unresponsive administrative systems – staff reported that the lack of dialogue, the lack of clarity about promotions and weak recognition are more corrosive than salary alone [5]. In Yemen, the ineffectiveness of implementation of sabbatical leave, failure to pay the same salaries to returnees as to colleagues and internal and external institutional conflict were found to be key drivers of academic brain drain [12]. Low salary, limited job opportunities and political instability were all identified as having a joint impact on faculty emigration in Nepal [13]. The evidence in Nigeria suggests that protracted industrial action, such as the frequent strike by the Academic Staff Union of Universities, is not only a symptom of a worsening quality of work-life and resulting brain drain [9] but also weak and inconsistent implementation of retention practice as a whole is a factor that influences staff turnover and a decline in institutional performance [11]. But underfunding of research is another recurrent cause: across Sub-Saharan Africa, public expenditure on higher education and research is estimated at being only around one percent of GDP, which is considered too low to maintain competitive research infrastructure or to cover sabbaticals, grants and equipment that keep research active staff. The absence of reliable power, water, and physical security conditions at work, as well as other poor working conditions, affect the basic psychological and safety needs which are fundamental to higher order needs at work [18] and have been confirmed throughout this literature as a proximate cause of academic departure. These pressures are exacerbated by massification, or the rapid growth of student numbers

in the absence of parallel increases in staffing, funding and infrastructure, which is well understood in the Education for All political agenda internationally since the Dakar Framework for Action [15].

2.4 Pull Factors and Destination Attraction

Push factors are not alone enough to account for migration choices; recent push-pull explanations highlight that pull factors in the destination such as institutional support, research funding, professional recognition and political and economic stability, work together with push factors in the home-institution to influence the final decision to migrate [14]. This joint effort is in keeping with the report that such diaspora networks and already existing family and professional contacts abroad significantly reduce the practical and psychological costs of migration, and enhance the attraction of places where a critical mass of expatriate academics are already present [1] [2]. The attraction of better resourced institutions in Europe, North America and increasingly the Gulf has been growing, not lessening, over the past decade for Sub-Saharan African academics in particular.

2.5 Effects of Brain Drain on the Quality of Higher Education

Although the channel of impact varies from study to study, the consequences of ongoing academic attrition have been reported consistently throughout the literature. In the context of Nigerian Universities, it has been established that poor quality of work-life of the few staff members remaining in the institutions due to increased workload, unresolved industrial disputes, has a direct connection with poor research outputs of the Universities and poor instructional quality [9]. In Ghana, low levels of retention have been found to be a cause of loss of institutional memory and mentoring capacity which are hard to replace when key personnel leave [10]. In Zimbabwe in particular, the staff continuity for the implementation of the Heritage-Based Education 5.0 agenda is dependent on sustained staff engagement with community-anchored research and innovation, which has been found to be undermined where institutions do not have this staff continuity [6]. Brain drain has also been associated with a decrease in technological and innovation capacity in the countries of origin, as the cluster of skilled human capital in the destination economies strengthens their already acquired technological edge over the countries where the skilled people were trained [1] and [2].

2.6 Strategies to Mitigate Brain Drain

A package of retention strategies is identified in the literature which is quite consistent, though not necessarily implemented well. It was found that in Nigeria, competitive salaries, clear promotion requirements and mentoring are important factors in both the retention and continued performance of staff [11]. Ghanaian technical universities have tried to ensure professional development for staff, recognition programmes and enhancing staff and management relationship, and qualitative indicators have shown that when staff feels appreciated and responsive by management, they are less likely to state that they intend to leave their jobs [10]. HRD activities in general, such as formal career-ladder systems, have been shown to have a significant relationship with individual's affective commitment to, and desire to stay in, an organization [20]. The Tertiary Education Service Commission restructuring of academic staff governance in Zimbabwe in 2021 is a direct institutional effort to tackle the working-condition and academic-freedom aspects of the problem [4], innovation is key to any development and Higher Education is at the core of its drive [25]. The Education 5.0 innovation agenda is an effort to tackle both the career-growth and research-funding aspects simultaneously by linking staff promotion to applied research, innovation and industrialisation outputs [6]. Sometimes lack of resources hinder innovation in Higher Education, and a framework for learning factories has been proposed to allow innovating in the virtual world [26]. The protection of the institution's investment in staff development has also been suggested as a factor to consider, with bonding arrangements (where staff undertake institutionally funded training in exchange for a period of service afterwards) proposed as a way to achieve this. However, there is limited evidence on the effectiveness of such arrangements over the longer term.

2.7 Research Gap and Contribution of This Study

The reviewed literature has two common limitations. First, a significant proportion of the empirical studies—including the case study which motivated this paper—are limited to a single institution or a single faculty and it is difficult to extrapolate the results to a national higher education system which is institutionally and disciplinarily diverse. Second, few studies compare the degree of use with perceived effectiveness of the retention strategies and few statistically test which types of push factor are most likely to predict perceived quality outcomes, rather than merely list push factors discussed in interviews. This paper overcomes both limitations, by surveying staff from 11 state universities and eight faculties, and by testing (rather than just describing) the relationships between the push factors, pull factors, perceived effects on quality, turnover intention, organisational commitment, and the extent and effectiveness of institutional retention strategies using reliability, correlation, analysis-of-variance and regression analysis.

3 METHODOLOGY

3.1 Research Philosophy and Design

The research philosophy used was pragmatist with mixed methods [21, 22, 23] in which elements of positivist and interpretivist research philosophies were blended. All quantitative data reported in this paper were collected using closed, structured items on a 1-5 scale, with open items providing additional qualitative information on push and pull factors, conditions for return migration and other additional factors of retention that were not addressed by the closed items. The design is explanatory and cross-sectional: data was gathered at one point in time and analysed to find statistically testable relationship between the causes, effects and mitigation of brain drain, that is, the original two-university based case-study analysis was extended to include a comparative and multi-site design.

3.2 Population, Institutions and Faculties Covered

Academic staff (Teaching Assistant and above) who are presently or have previously worked at a Zimbabwean public (state) university were targeted. The sampling frame for this paper extended beyond the Faculty of the Built Environment at two universities in Bulawayo and Gweru to include eleven state universities namely: the University of Zimbabwe, the National University of Science and Technology, the Midlands State University, Chinhoyi University of Technology, Great Zimbabwe University, Bindura University of Science Education, the Harare Institute of Technology, Manicaland State University of Applied Sciences, Lupane State University and Gwanda State University. The respondents were from eight faculties namely: Science and Technology, Built Environment, Commerce, Engineering, Arts and Social Sciences, Agriculture, Education and Health Sciences.

3.3 Sample and Sampling Technique

The sampling method employed in this study was a combination of purposive and convenience and snowball sampling which involved the use of non-probability sampling as was done in the original case study but this has been applied on a far larger scale in sampling the eleven institutions to qualify respondents. In total, 157 respondents completed the survey and gave informed consent. Out of these, 104 (68.9%) were currently working academic staff, 23 (15.2%) had resigned or left their jobs in the last five years but still were formally registered as academics, 17 (11.3%) were on study leave abroad without losing their job and 7 (4.6%) had taken voluntary retirement. Thirty respondents (15 who resigned and 15 early retirees) were considered former staff for the purpose of migration-destination and reason-for-leaving questions.

3.4 Research Instrument

Data were gathered via a structured online questionnaire with sections that included: eligibility and consent, institutional and demographic data (institution, faculty, gender, age band, rank, contract type, years of service, years of industry experience, highest qualification, and publication record), twelve push items and eight pull items rated on a five-point agreement scale, three turnover-intention items, thirteen job satisfaction and organisational commitment items (with reverse coded items re-coded before analysis), twelve paired items on the extent of use and perceived effectiveness of institutional retention strategies, and for those who are no longer working, items on year and destination of departure, primary reason for departure, and likelihood of return if conditions improve. An attention check included in the push-factor battery was one item.

3.5 Data Quality and Analytic Sample

Of the 157 responses collected, six (3.8%) were not valid because they failed the embedded attention check, and were therefore not included in the analytic sample. This data-cleaning task was not included in the original case study's sample of 40 respondents, and is meant to enhance the reliability of the Likert-scale composites presented below. .

3.6 Data Analysis Procedure

Quantitative data was analysed using Python (pandas, SciPy and statsmodels). Descriptive statistics (means and standard deviations) were calculated for all the items on the Likert scale and for the composite scores created by averaging related items in the concepts: push factors, pull factors, perceived effects, strategy use, strategy effectiveness, turnover intention, job satisfaction and organisational commitment. Cronbach's alpha internal consistency of each composite was calculated, where .70, .80 and .90 are considered acceptable, good and excellent, respectively [24]. Independent-samples t-test (gender) and one-way analysis of variance (institution, faculty, academic rank, and years of service) were used to test the differences between groups. Pearson correlation was used to test the relationship between the composite scores, and a multiple linear regression model was estimated to determine which categories of push factor best predict the overall perceived reduction in quality of higher education. Conventional $\alpha = .05$ was used throughout to determine statistical significance

3.7 Ethical Considerations

Participation was voluntary and after an informed consent statement was read; non responding respondents were not included in the data set. Beyond a system-generated respondent identifier, no personally identifying information was collected, and institutional and demographic information was reported only in aggregate or cross-tabulated form, as in the original case study.

4 RESULTS AND ANALYSIS

4.1 Respondent and Institutional Profile

Table I provides an overview of the demographic and career profile of the 151 respondents who passed data-quality checks. The gender split was 67.5% male and 30.5% female and included all six academic levels from Teaching Assistant (16.6%) to Professor (8.6%) with the highest number of respondents at Lecturer level (28.5%) and Senior Lecturer (24.5%). The majority (68.9%) were permanently appointed and 34.4% had the highest qualification of PhD/Doctorate, and 9.3% had postdoctoral qualifications. The widened sampling frame resulted in meaningful, although an uneven, sampling of the sector with respondents drawn from all eleven target institutions, ranging from 10 respondents from Gwanda State University to 19 respondents from University of Zimbabwe and all eight target faculties ranging from 7 respondents in Health Sciences to 28 respondents in Science and Technology.

Table 1: Respondent Demographic and Professional Profile (N = 151)

Characteristic	Category	%
Gender	Male	67.5
	Female	30.5
	Prefer not to say	2.0
Age bracket	Under 30	12.6
	30-39	14.6
	40-49	29.8
	50-59	17.9
	60 and above	25.2
Academic rank	Teaching Assistant	16.6
	Assistant Lecturer	7.3
	Lecturer	28.5
	Senior Lecturer	24.5
	Associate Professor	14.6
	Professor	8.6
Contract type	Permanent	68.9
	Fixed-term contract	26.5
	Visiting / part-time	4.6
Years of service (current institution)	0-5 years	20.5
	6-10 years	14.6
	11-15 years	28.5
	More than 15 years	36.4
Highest qualification	Bachelor's degree	7.3
	Postgraduate Diploma	21.9
	Master's degree	27.2
	PhD / Doctorate	34.4
	Postdoctoral	9.3

Employment status	Currently employed	68.9
	On study leave abroad, still employed	11.3
	Resigned / left within past 5 years	15.2
	Took early retirement	4.6

4.2 Reliability of the Research Instrument

Cronbach's alpha of each measurement composite is presented in Table II. All eight composites were above the .70 value considered to be a good reliability threshold, and the push-factor, pull-factor, perceived-effect, strategy-use and strategy-effectiveness batteries reached the .90 'excellent' threshold [24]. This level of internal consistency was obtained on the larger 151-respondent sample, quality screened and supports the use of composite scores in the correlation and regression analyses that follow.

Table 2: Reliability of measurement scales (cronbach's alpha)

Scale	Items	n	Alpha
Push factors (causes)	12	151	0.926
Pull factors	8	151	0.901
Perceived effects on quality	12	151	0.929
Extent of strategy use	12	151	0.920
Perceived strategy effectiveness	12	151	0.899
Turnover intention (active staff only)	3	121	0.819
Job satisfaction	3	151	0.824
Organisational commitment	6	151	0.882

4.3 Perceived Causes (Push Factors) of Brain Drain

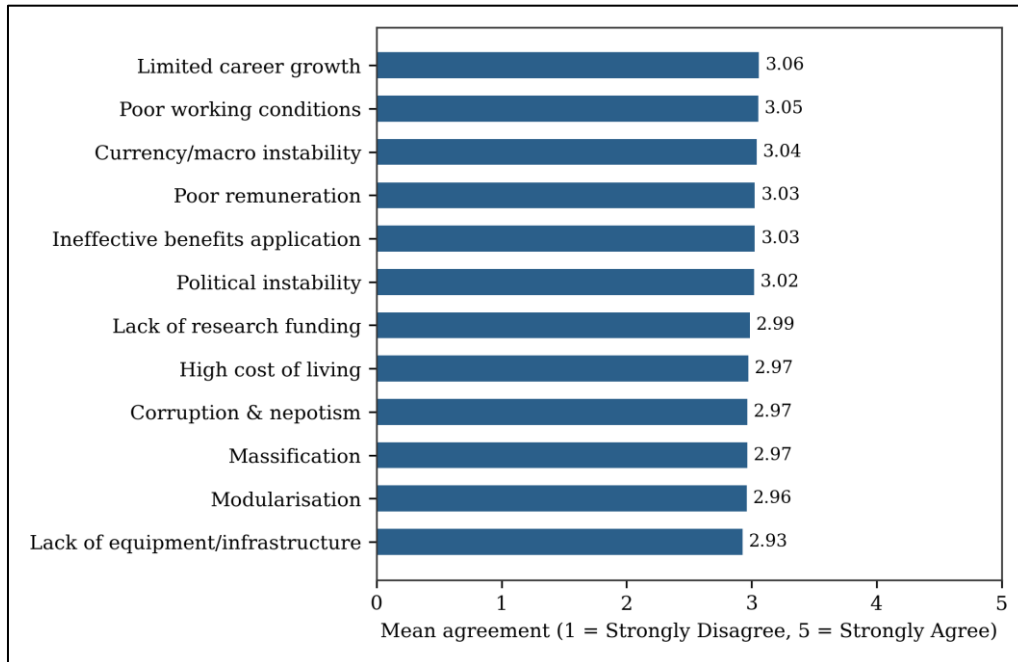


Figure 1: Perceived causes (push factors) of brain drain, ranked by mean agreement

(1 = Strongly Disagree, 5 = Strongly Agree; n = 151).

Fig. 1 shows the twelve push-factor items, in order of mean agreement. What is most striking about the extended dataset is that the items are all grouped close together: Limited career growth ($M = 3.06$, $SD = 1.28$), poor working conditions ($M = 3.05$, $SD = 1.27$), currency and macroeconomic instability ($M = 3.04$, $SD = 1.23$), poor remuneration ($M = 3.03$, $SD = 1.33$) and ineffective application of staff benefits ($M = 3.03$, $SD = 1.11$) differ by only 0.03 scale points, and even the lowest item, lack of necessary equipment and infrastructure ($M = 2.93$, $SD = 1.13$), is only 0.13 points away from the top-ranked cause. The image is quite different from that of a first-generation two-university, single-faculty model, where the interviewees, with no hesitation, identified bad working conditions as the top reason for leaving. In the broader sample of eleven universities and eight faculties, none of these factors is a primary driver of migration, and all three types of factors are likely to combine, with none taking precedence, to pressure academic staff into migration decisions.

4.4 Perceived Pull Factors

The pull-factor ranking is given in Fig. 2. The pull factor with the highest mean was family reunification, followed by professional recognition abroad and better prospects for career advancement abroad, with means of 3.01, 2.99 and 2.97, respectively. Although better remuneration is a key push factor to help make the initial choice to leave, it was the least preferred pull factor ($M = 2.77$) indicating that, at the point of departure, non-financial factors, such as network effects and recognition/career prospects, may be just as important in determining where staff moves to.

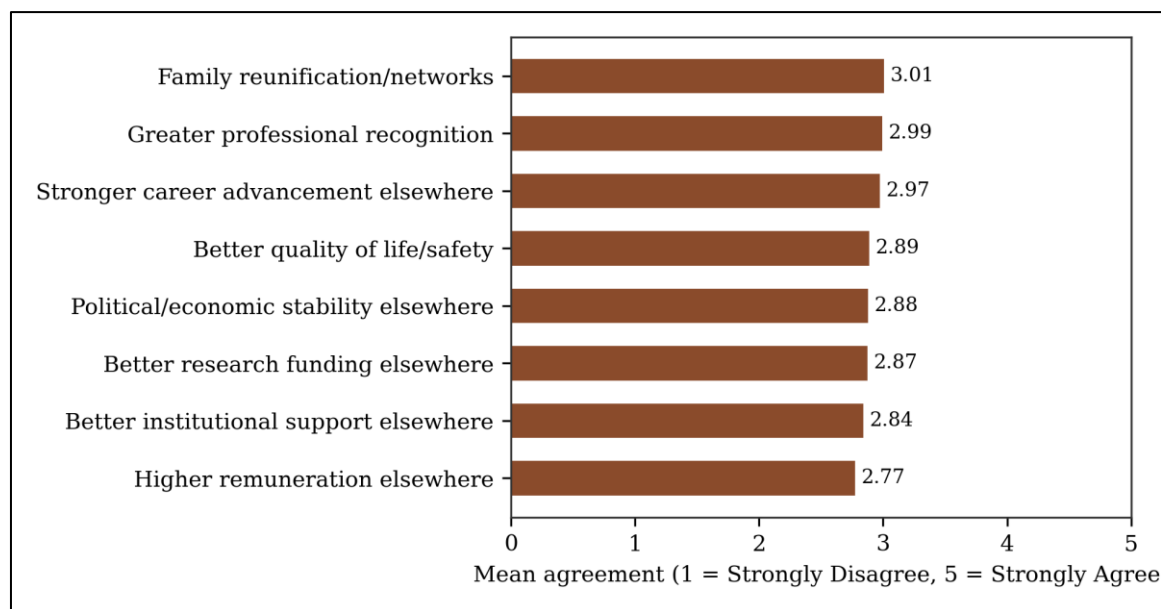


Figure 2: Perceived pull factors attracting academics to alternative institutions or careers ($n = 151$).

4.5 Perceived Effects of Brain Drain on Quality of Higher Education

The twelve effect items are shown in Fig. 3. Most strongly endorsed consequences were increased recruitment and training costs ($M = 3.05$) and the lack of skilled staff to teach at various academic levels ($M = 3.03$) followed closely by underdevelopment and lack of institutional growth ($M = 3.02$) and the risk of closure or suspension of programmes ($M = 3.01$). The least ranked effect was reduced research output ($M = 2.83$), where—as was the case with research funding—the relatively low rank indicates that the respondents consider the effect of brain drain on research capacity to be more immediately and strongly felt on teaching capacity and the institutions' running costs than on research output per se.

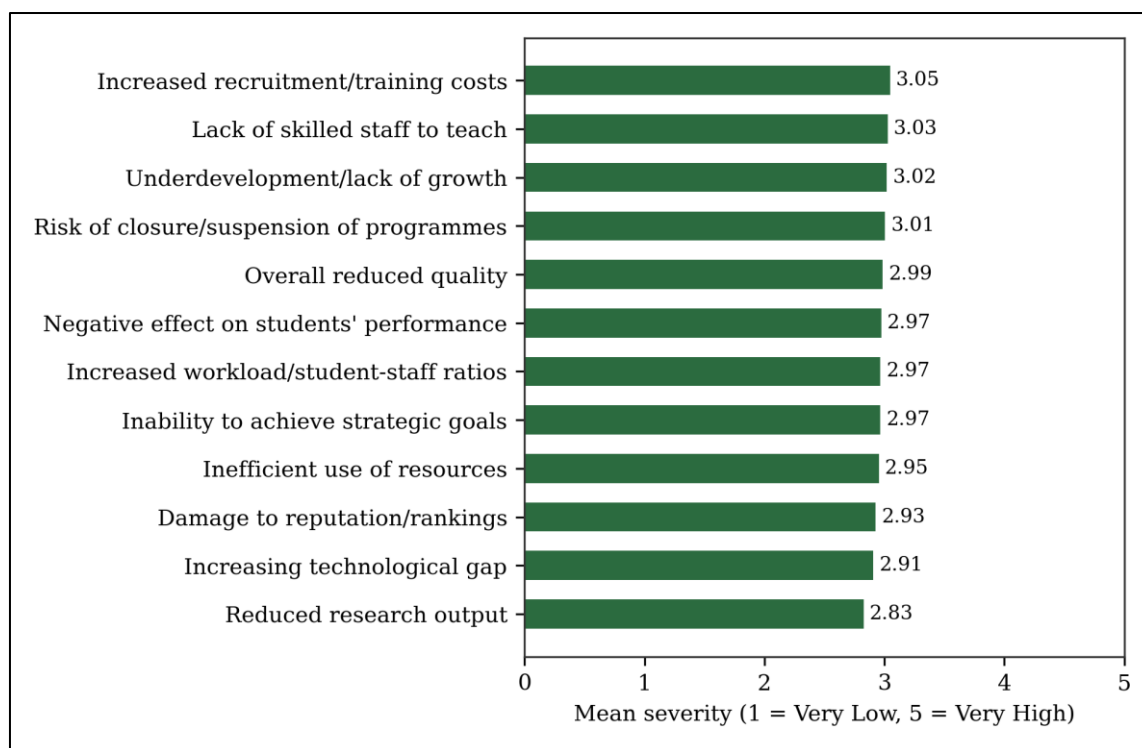


Figure 3: Perceived effects of brain drain on the quality of higher education, ranked by mean severity (1 = Very Low, 5 = Very High; n = 151).

4.6 Relationship Between Brain Drain and Perceived Quality of Higher Education

Overall, on the balance the respondents were ambivalent rather than convinced of the relationship between brain drain and quality; the single overall item asking the extent to which brain drain and quality of higher education are related returned a mean of 2.88 (SD = 1.25), with 31.8% agreeing or strongly agreeing, and 37.1% disagreeing or strongly disagreeing (the remaining 31.1% were neutral). The correlation matrix of the principal composite scores is presented in Table III. The perceived-effects composite was highly correlated with this overall relatedness item ($r = .727, p < .001$) and the single overall-quality-reduction item ($r = .826, p < .001$), indicating the internal validity of the effects battery. Push factors were slightly, but moderately, correlated with pull factors ($r = .518, p < .001$), which is consistent with the push-pull theory suggesting that things that push people away also pull them away, and the perceived reduction in quality was positively but only moderately correlated with both the push ($r = .419, p < .001$) and pull ($r = .438, p < .001$) factors.

Table 3: Pearson Correlations Among Composite Scores (N = 151)

Composite pair	r	p
Push factors <-> Pull factors	0.518	< .001
Push factors <-> Perceived effects	0.600	< .001
Push factors <-> Overall quality reduction (H12)	0.419	< .001
Push factors <-> Overall relatedness (H0)	0.455	< .001
Pull factors <-> Perceived effects	0.539	< .001
Perceived effects <-> Overall quality reduction (H12)	0.826	< .001
Perceived effects <-> Overall relatedness (H0)	0.727	< .001
Strategy use <-> Strategy effectiveness	0.563	< .001
Push factors <-> Turnover intention (n = 121)	0.662	< .001
Organisational commitment <-> Turnover intention (n = 121)	-0.586	< .001
Job satisfaction <-> Organisational commitment	0.765	< .001

4.7 Institutional and Faculty Variation

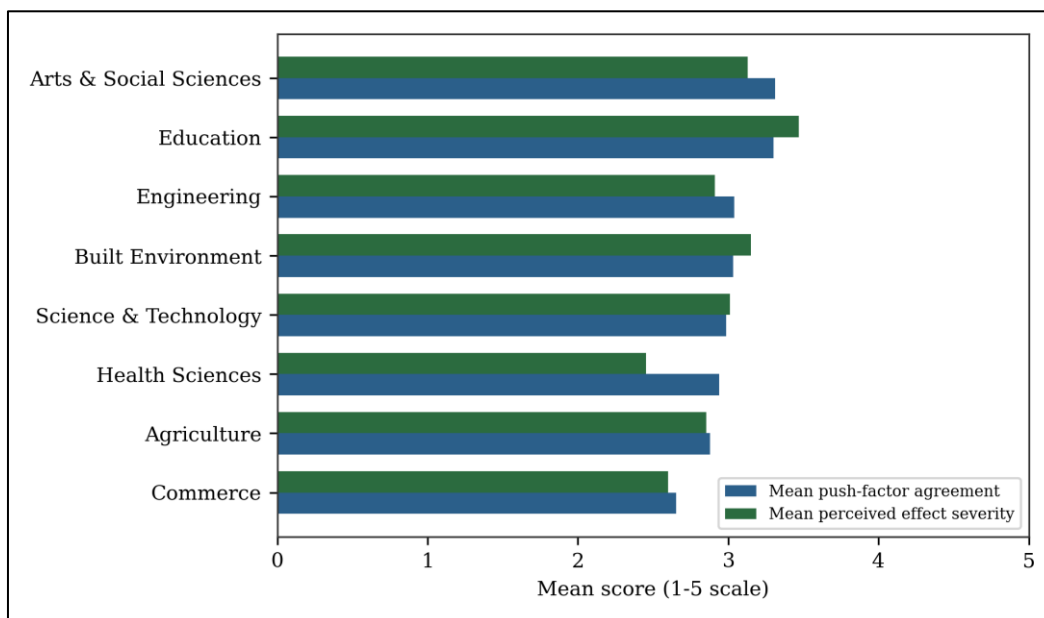


Figure 4: Mean push-factor agreement and perceived effect severity by faculty

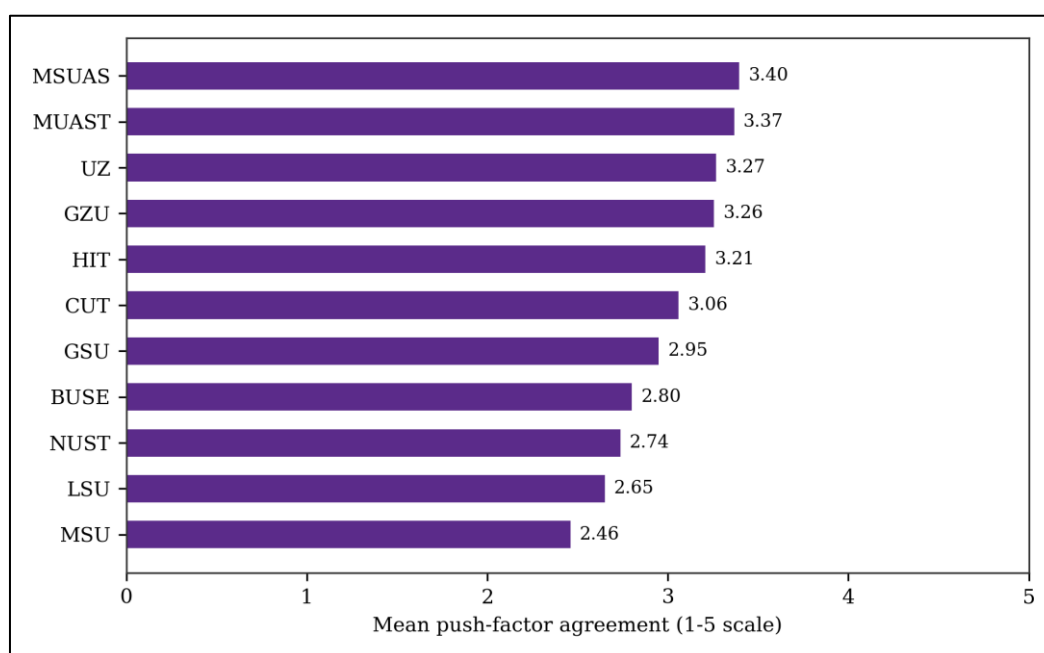


Figure 5: Mean push-factor agreement by state university (n = 151). Institution acronyms are as defined in Section III-B.

One of the main aims in expanding the sample beyond two universities and one faculty was to investigate if there are systematically different causes and consequences of brain drain across universities and faculties. A statistically significant difference between the mean push factor agreement for the eleven institutions was found by one-way ANOVA ($F = 1.93$, $p = .046$). It was observed that the Manicaland State University of Applied Sciences ($M = 3.40$) and the Marondera University of Agricultural Sciences and Technology ($M = 3.37$) had the highest push-factor agreement while the Midlands State University ($M = 2.46$) and Lupane State University ($M = 2.65$) had the lowest. In contrast, there was no significant difference between the 8 faculties when it came to push factor agreement ($F = 1.13$, $p = .348$) and the difference between the perceived effects across the faculties was just short of conventional significance ($F = 1.83$, $p = .087$), with the highest being reported by Education ($M = 3.47$) and Built Environment ($M = 3.15$) and the lowest by Health Sciences ($M = 2.45$) and Commerce ($M = 2.60$) as shown in Fig. 4. Combined with these, the results show that, for this sample, perceived push factor intensity is a better predictor of the institution to which a member of staff belongs

than of the faculty to which he or she belongs, which, by design, a single faculty case study at two institutions could not have identified.

4.8 Demographic Differences

In contrast to the original 40-respondent case study that identified a statistically significant difference between the perceived causes of brain drain by gender, no statistically significant difference was found in this study by gender (female $M = 3.15$, $SD = 0.73$; male $M = 2.94$, $SD = 0.95$; $t = 1.48$, $p = .141$), by academic rank ($F = 0.63$, $p = .679$), or by length of service at current institution ($F = 0.49$, $p = .692$). Once the analysis is extended across a much larger and more institutionally diverse sample, the differences across the various demographics and seniority categories that were discernible in the small single-context sample seem to be masked by the much wider, institutionally-based variation reported in Section IV-G.

4.9 Predictors of Perceived Quality Reduction

To determine which category of push factors is most strongly significant, the twelve push factors were combined together into four theoretically-driven composites: economic (remuneration, currency instability, cost of living), working conditions and infrastructure (working conditions, equipment and infrastructure, massification, modularisation), career and governance (career growth, benefits application, corruption and nepotism) and external (research funding, political instability) and regressed upon the one item assessing overall perceived quality reduction. The overall model statistically significantly accounted for 21.3% of the variance in perceived quality reduction (R -squared = .213, adjusted R -squared = .191) and was statistically significant ($F(4,146) = 9.88$, $p < .001$). Only the career and-governance composite was statistically significant as a predictor ($\beta = 0.495$, $p = .006$); the economic and working-conditions and external composites were not significant when controlling for the other composites (as shown in Table IV). This implies that, while economic and infrastructural push factors have an absolute high rating (Section IV-C), the career-progression and institutional-governance aspects of brain drain (limited advancement, inconsistently applied benefits) and perceptions of corruption and nepotism most strongly affect staff perceptions that brain drain is decreasing the overall quality of higher education.

Table 4: Regression of overall perceived quality reduction on push-factor composites

Predictor	Beta	SE	p
(Constant)	1.333	0.363	< .001
Economic composite	0.237	0.179	.188
Working conditions / infrastructure composite	-0.002	0.192	.992
Career and governance composite	0.495	0.177	.006 *
External composite	-0.183	0.165	.269

Model: R -squared = .213, Adjusted R -squared = .191, $F(4,146) = 9.88$, $p < .001$. * significant at $p < .05$.

4.10 Turnover Intention, Job Satisfaction and Organisational Commitment

For the 121 active respondents (currently employed staff and those on study leave abroad who are still formally employed) the composite turnover-intention score on the five-point scale ($\alpha = .819$) was on average 2.98 ($SD = 1.06$). Turnover intention was positively strongly correlated with push-factor intensity ($r = .662$, $p < .001$) and negatively strongly correlated with organisational commitment ($r = -.586$, $p < .001$) and job satisfaction was positively strongly correlated with organisational commitment ($r = .765$, $p < .001$), as reported in Table III. The relationships are consistent with the prediction of organisational-commitment theory that affective attachment to an institution will counteract the tendency to leave even if push factors are high, and they reveal that organisational commitment is an important additional factor that can be manipulated by institutional managers who would like to minimise attrition than merely the intensity of push factors.

4.11 Profile of Former Staff: Destinations, Reasons and Return Conditions

Of the 30 respondents identified as "former staff," 36.7% had departed between 2022 and 2024, which was the time of the most recent severe currency and inflation problems in Zimbabwe, and 13.3% had left as late as 2025. Half (50.0%) went to an academic institution in another country in Africa, while a further 23.3% went to an academic institution in another country outside Africa – meaning that most transfers were not exactly out of the profession, but lateral movement within the academic sphere to a better resourced system; 16.7% moved into a non-academic role outside Zimbabwe. The main reasons given for leaving were: poor pay (30.0%), better working conditions elsewhere (16.7%), lack of prospects for advancement (16.7%), political and economic security elsewhere (16.7%), and better research

funding or facilities elsewhere (13.3%). Former employees indicated that they would be most likely to consider coming back if there was greater political and economic stability in the country ($M = 3.07$ on a five-point likelihood scale); significantly better remuneration ranked second ($M = 2.93$), while improved research funding or facilities ranked third ($M = 2.90$), and family or personal circumstances were rated lowest ($M = 2.80$). None of these had significantly high mean values, indicating that, for most of the former staff in this sample, return migration would be dependent on a combination of improvements rather than on any single one.

4.12 Institutional Strategies and Their Perceived Effectiveness

57.6% of respondents agreed that their institution had formal policies which were designed to reduce brain drain while 16.6% were not certain and 25.8% reported that no such formal policies exist; 47.7% agreed that their institution was currently experiencing problems holding on to qualified academic staff. Fig. 6 shows the level of usage and effectiveness of 12 retention strategies. The most commonly reported strategies were: improving working conditions ($M = 3.28$), increased research funding and grants ($M = 3.26$) and study-leave or sabbatical support ($M = 3.25$); and the least common were: curriculum review ($M = 3.01$) and recognition and awards programmes ($M = 2.95$). The response to perceived effectiveness broadly followed a similar yet not identical sequence: successions plans and mentorship ($M = 3.12$), study-leave or sabbatical support ($M = 3.09$) were perceived as the most effective, whereas Education 5.0 innovation agenda ($M = 2.89$) and curriculum review ($M = 2.93$) were perceived least. As shown in Table III, extent of use and perceived effectiveness were highly positively correlated between strategies ($r = .563$, $p < .001$), meaning that on average, strategies used more consistently are also perceived as more effective, but the correlation between overall strategy use and perceived-effects composite itself was weak and only marginally significant ($r = -.143$, $p = .080$); meaning that no one strategy or package of strategies currently in use is yet strong enough to offset the perceived effects of brain drain sector-wide.

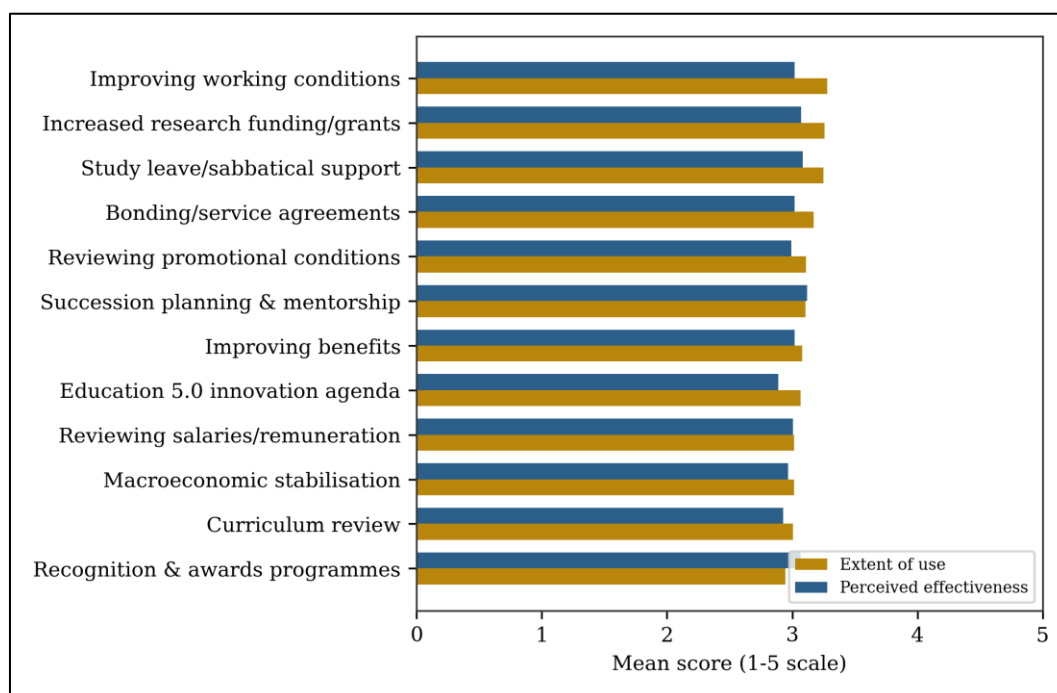


Figure 6: Extent of use versus perceived effectiveness of institutional retention strategies (n = 151).

4.13 Stakeholder Perceptions of Burden and Responsibility

In response to the question of who suffers the most from brain drain, respondents most commonly identified the country as a whole (27.8%) and students (27.2%) after which were lecturers (18.5%) and university management (15.9%) and lastly, government (10.6%), indicating that academic staff see the cost of brain drain as spread across the broader community rather than concentrated in any particular stakeholder group. Views on the claim that skilled academic migration can ever have a positive impact on the quality of higher education were split: 41.1% agreed, most frequently identifying exposure to international best practice and the potential for renewed collaboration, 33.1% disagreed and 25.8% were undecided. Academic staff turnover was perceived as being driven by government policy (29.1%), by the management of the university (28.5%) or equally influenced by both (31.1%) and least influenced by external and/or global market forces (11.3%), thus supporting the regression result in Section IV-I that governance factors are at least as important as macro-level policy in driving brain drain.

5 CONCLUSIONS

This paper aimed at investigating the causes and consequences of academic brain drain on the quality of higher education in a much broader range of Zimbabwean state universities and faculties than have been studied so far and at assessing the strategies employed in combating academic brain drain. In respect of the first objective, the wider sample reveals that the issues of brain drain are not driven by a single factor; the economic pressures, organisational pressures and developmental pressures are seen as all being equally significant, whereas the previous narrower sample case studies all identified working conditions as the primary factor. On the second objective, the respondents do not strongly associate brain drain with increased recruitment and training costs, or with an insufficient number of skilled staff to teach, but at the level of the predictive analysis, it is specifically career-progression and governance-related causes that best predict staff perceptions that brain drain is reducing overall quality. In regard to the third objective, institutional and demographic differences, the study reveals that there are significant differences in perceptions of brain drain by institution but not by faculty, gender, academic rank or years of service, suggesting that the institutional culture and governance is the main source of differences across the sector rather than the faculty or individual staff characteristics. The fourth objective, mitigation strategies, shows that just over half of institutions perceived to have formal retention strategies in place, and that the extent to which a strategy was used was highly correlated with its perceived effectiveness, but that no combination of strategies or individual strategies currently used were strongly associated with a reduction in the perceived effects of brain drain, leaving significant scope for improvement in the design, resourcing and implementation of existing strategies.

Recommendations

For university management: the intensity of the push factor varies widely across different institutions rather than among faculty and retention interventions should be designed and resourced at institutional level, based on individual university's own staff-perception data and not applied uniformly across the sector; career-progression and governance factors were the strongest predictor of perceived quality reduction, therefore it is important that promotion criteria are transparent, timely and consistently applied across the sector, and staff benefits (particularly sabbatical leave) are equitable and consistently followed at University level; one half of former staff moved to an academic institution elsewhere in Africa rather than out of the academic sector, so structured collaboration, joint research and staff-exchange arrangements with other Universities in the region and internationally may be a way of retaining a link to Zimbabwean Universities even where full-time retention was not achieved.

For government and policy makers: the ability of the Tertiary Education Service Commission (TESC) reforms and the Education 5.0 agenda to reverse academic brain drain should be complemented by regular monitoring of staff retention and intention to leave at the institutional level, as the aggregate, sector-wide figures in this study show that there is substantial variation across institutions; and macro-economic stabilisation is likely to remain a necessary, though not sufficient, policy condition for reversing academic brain drains.

For the sector as a whole: the high correlation between strategy use and perceived effectiveness and the overall weak correlation between strategy use and perceived effectiveness suggest that, institutions and government should invest in systematically evaluating which specific retention strategies are likely to be effective in which institutional contexts, rather than assuming that, once adopted, any strategy will simply be effective by default, and that curricula that foster stronger independent research and study skills among students may partially mitigate the teaching-quality impacts of future staff departures while longer-term retention strategies take effect.

Limitations

The sample, though significantly larger and more varied institutionally than the original case study, was in fact a non-probability sample drawn by purposive, convenience and snowball sampling and there was some unevenness in coverage between the eleven institutions and eight faculties, with numbers of respondents between 10 and 19 per institution and 7 and 28 per faculty. The cross-sectional design reflects perceptions at one specific moment in time and does not allow to determine the causality of the relationship between for instance organisational commitment and turnover intention. Although reliable in the psychometric sense shown in Table II, perceptual or self-reported Likert-scale measures face social-desirability and recall bias, especially if former staff report on their motivations to leave.

Suggestions for Further Research

Future research would benefit from longitudinally extending this design, and following the same group of institutions over more years to see if there are differences in the intensity of push factors at the institutional level, as the Tertiary Education Service Commission reforms and the Education 5.0 agenda evolve. Future research could usefully also explore what specific institutional practices make the difference between Universities with relatively low push-factor agreement (such as the Midlands State University and Lupane State University in this sample) and those with relatively high push-factor agreement (such as the North-West and the University of Zambia in this sample), to identify good

practice for transfer. Finally, more controlled or quasi-experimental studies of the effects of specific retention strategies, instead of further cross-sectional perception surveys, would be useful to identify which strategies actually cause a reduction in attrition, and to identify which do not.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

Acknowledgments

The authors would like to acknowledge the Department of Industrial and Manufacturing Engineering Department of the National university of Science and Technology.

Disclosure of conflict of interest

There is no conflict of interest.

REFERENCES

- [1] S. Firsing, "Africa's migration and brain drain revisited," Africa at LSE, London School of Economics, Mar. 19, 2024. [Online]. Available: <https://blogs.lse.ac.uk/africaatlse/2024/03/19/africas-migration-and-brain-drain-revisited/>
- [2] S. A. F. Mohamed, G. Amer, and K. A. Fattah, "The impact of brain drain on economic growth: Addressing diaspora externalities," *Migration Letters*, vol. 21, no. S2, pp. 762-786, 2024.
- [3] W. Kigotho, "Funding levels of higher education a grave concern," *University World News*, Jun. 24, 2021.
- [4] T. Mukeredzi, "New law aims to foster academic freedom, arrest brain drain," *University World News*, Jun. 3, 2021.
- [5] T. T. Kanonge and M. H. R. Bussin, "Pre-conditions for employee motivation to curb Zimbabwe's academic brain drain," *SA Journal of Human Resource Management*, vol. 20, art. a1819, 2022.
- [6] E. C. Garwe, "Heritage-based Education 5.0: Zimbabwe's decolonial approach to higher education," *Discover Education*, vol. 4, art. 289, 2025.
- [7] *Newsday Zimbabwe*, "As University of Zimbabwe strike drags on, pressure mounts on the country's higher education system," *Newsday Zimbabwe*, Jul. 2025.
- [8] African Development Bank, "Zimbabwe Economic Outlook," AfDB, updated Jun. 18, 2026. [Online]. Available: <https://www.afdb.org/en/countries/southern-africa/zimbabwe/zimbabwe-economic-outlook>
- [9] O. E. Akinwale, O. L. Kuye, and O. E. Akinwale, "Trajectory of brain-drain and quality of work-life amongst Nigeria's university lecturers: Academic Staff Union of Universities (ASUU) incessant strike in retrospect," *International Trade, Politics and Development*, vol. 7, no. 2, pp. 115-137, 2023.
- [10] E. N. Kuuyelleh, M. Alqahtani, and E. Akanpaadgi, "Exploring academic staff retention strategies: The case of Ghanaian technical universities," *SA Journal of Human Resource Management*, vol. 20, art. a1975, 2022.
- [11] O. Salau, R. Worlu, A. Osibanjo, A. Adeniji, T. Atolagbe, and J. Salau, "Determinants of retention strategies and sustainable performance of academic staff of government-owned universities in Nigeria," *F1000Research*, vol. 9, art. 902, 2021.
- [12] A. Muthanna and G. Sang, "Brain drain in higher education: Critical voices on teacher education in Yemen," *London Review of Education*, vol. 16, no. 2, pp. 296-307, 2018.
- [13] B. R. Mainali, "Brain drain and higher education in Nepal," in *Higher Education in Nepal*, Abingdon, UK: Routledge, 2019, pp. 87-99.
- [14] S. Nikou and M. Luukkonen, "The push-pull factor model and its implications for the retention of international students in the host country," *Higher Education, Skills and Work-Based Learning*, vol. 14, no. 1, pp. 76-94, 2024.
- [15] UNESCO, "The Dakar Framework for Action: Education for All - Meeting Our Collective Commitments," *World Education Forum*, Dakar, Senegal, 2000.
- [16] F. Herzberg, B. Mausner, and B. B. Snyderman, *The Motivation to Work*, 2nd ed. New York, NY, USA: Wiley, 1959.
- [17] K. Lewin, "Frontiers in group dynamics: Concept, method and reality in social science; social equilibria and social change," *Human Relations*, vol. 1, no. 1, pp. 5-41, 1947.
- [18] A. H. Maslow, "A theory of human motivation," *Psychological Review*, vol. 50, no. 4, pp. 370-396, 1943.

- [19] W. H. Mobley, "Intermediate linkages in the relationship between job satisfaction and employee turnover," *Journal of Applied Psychology*, vol. 62, no. 2, pp. 237-240, 1977.
- [20] J. P. Meyer and N. J. Allen, "A three-component conceptualization of organizational commitment," *Human Resource Management Review*, vol. 1, no. 1, pp. 61-89, 1991.
- [21] J. W. Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, 4th ed. Thousand Oaks, CA, USA: SAGE Publications, 2014.
- [22] M. Saunders, P. Lewis, and A. Thornhill, *Research Methods for Business Students*, 5th ed. Harlow, UK: Pearson Education, 2009.
- [23] C. R. Kothari, *Research Methodology: Methods and Techniques*, 2nd ed. New Delhi, India: New Age International, 2004.
- [24] J. C. Nunnally and I. H. Bernstein, *Psychometric Theory*, 3rd ed. New York, NY, USA: McGraw-Hill, 1994.
- [25] M. P. Chingozha, L. Ruvengo, I. Mapindu and G. Shava, "Restructuring Higher Education to Achieve Quality and Innovation, A Review of Literature," *Journal of Current Engineering and Technology*, vol. 4, no. 1, pp. 1-8, 2022.
- [26] Ndiyamba, D., Murena, E., Kasukusa, S., Mafuratidze, F., Nenzhelele, T., Mpofu, K. and Mapindu, I. (2026) 'Learning factories as a catalyst for innovation in Southern African engineering education', in *CLF 2026 Book of Short Papers on Learning Factories: Proceedings of the 16th Conference on Learning Factories*, Bolzano, Italy, 5–7 May 2026. Bolzano: Free University of Bozen-Bolzano, pp. 93–99. doi:10.5281/zenodo.20780648.