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Legal provisions and the problems encountered by the girl child in pursuing science education and training in Zimbabwe

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Abstract: *The studywas carried out toinvestigate and examine the problems encountered by girls and young women in accessing science education and trainingin relation to a proviso in the Constitution of Zimbabwewhich requires observance of gender balancein all spheres including appointmentsto high positions whereas the same Constitution requires that such appointments should be done on the basis of merit. This study was a review which involved collection and analysis of data from various sources including academic literature, country reports, strategic frameworks, press reports, statistical information, legislative statutes, policies and other relevant government documentations. The study found that if fewer girls and women pursue science, technology, engineering and mathematics at high schools, colleges and universities,achieving gender parity during appointments to higher positions in the world of work remains a paradox in the form of a 'pie in the sky' as most women would not qualify. Some high posts will not have female applicants. The study found that girls and young women were faced with a plethora of problems chief among which are cultural stereotypes where the science fields are still viewed as male domains and the belief that 'science and mathematics are difficult subjects'. The study recommended concerted efforts by government and non-State players to promote women in science. Training or re-training of teachers and lecturers who handle science and mathematics was recommended so that they use exciting modern teaching techniques which demystify and simplify concepts to build confidenceamong girls and young women to pursue science, technology, engineeringand mathematicscareers. There should be increased use of successful women in science and mathematics as role models to inspire the girl child froma tender age as in 'catch them young'.*

Key words*: girl child, STEM, gender balance, women in science, gender parity*

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I. Introduction

The number of females participating in science, technology, engineering and mathematics is growing, yet men continue to outnumber women, especially at high school, colleges andhigher learning institutions and at the professional levels. At primary and secondary schools up to Ordinary level,both girls and boys take science and mathematics subjects in nearlyequal numbers but when students proceed tohigh school and tertiary levels, only a few females pursue careers in science, technology, engineering and mathematics. As a result of this; science and technology fieldsare dominated by males despite the tremendous gains that girls and young women have made in education since independence when education for all (EFA) was made law.

1.1Background

Women and girls in Zimbabwe comprise about 51% of the national population, yet the scarcity of the females in science, technology, engineering and mathematics careers remains stark. The question is 'What drives these gender disparities in science education and training notwithstanding the support from the supreme law?'

Thabete (2009) states that Zimbabwe continues to be ranked highly in the SADC region with regards literacy rates. It ranks second for females and first for males in terms of literacy rates (Thabete 2009). UNICEF Annual Report states that in Sub-Saharan Africa, 33.3 million girls of primary and lower secondary school age are out of school. This number rises to 52.2 million when taking into account girls of upper secondary school age. A study by CAMFED[1] (Zimbabwe) proved that education changes everything for the girl child because:

- her income increases by 25% per year for every year of secondary education;

[1]CAMFED : Campaign for Female Education is an international non-governmental organization founded in 1993 whose mission is to eradicate poverty in Africa through the education of girls and the empowerment of young women.

- unlike men, a girl child when educated will invest 90% of her earnings to her family;
- education makes the girl child three times unlikely to become HIV positive;
- if educated, a girl child will marry later and have a smaller family;
- an educated girl will resist gender-based violence and discrimination and,
- an educated girl child will invest in her children's education hence the common adage 'When you educate a girl, you educate a nation'.

Education is a universal right. It is also a matter of justice (CAMFED, 2019). By the same token, according to this study, making girls access science education and training is a matter of justice.The United Nations Girls' Education Initiative (UNGEI) Report (2010) states that by 1982, 64 percent of the Zimbabwe's illiterates were female; but by 2002, the percentage of female illiterates had reduced drastically to just 11.75 percent. Despite this impressive improvement, the literacy rate was higher in males, constituting 90 percent than among females at 80 percent. This means that women still constitute the majority of the illiterates in both urban and rural areas.

According to Chung (2009), during the colonial era in 1979, only a third of Zimbabwe's eligible children had access to primary education and only four percent attended secondary school. By 1990, the numbers had increased four-fold in primary school enrolment and ten-fold in secondary school enrolment thus registering a world record-breaking success in education expansion.

The Constitution of Zimbabwe, the Education Act and the National Gender Policy provide basis for gender equity and equality in education.Section 9 of the Constitution of Zimbabwe (2013) under Good Governance, states that the State must make sure appointments to public offices must be made primarily on the basis of merit (p18). It is common cause that if issues that exclude the girl-child from science education and training are not addressed, most females will be found wanting during appointments when it comes to merit in certain key sectors.

Section 56 of the Constitution of Zimbabwe states that there should be equality and non-discrimination. It goes on to state that, 'Women and men have the right to equal treatment, including the right to equal opportunities in political, economic, cultural and social spheres' (p29).

Section 56 and Section 9 of theConstitutionwhich are cited above make appointing equal numbers of males and females in higher positions a dilemma if it has to be done on merit unless underlying fundamentals such as access by females to science education and training at high schools, colleges and universities is addressed.

Section 17 of the Constitution (2013:19) further makes it clear that:
(1) The State must promote full gender balance in Zimbabwean society, and in particular:
(a) the State must promote the full participation of women in all spheres of Zimbabwean society on the basis of equality with men;
(b) the State must take all measures, including legislative measures, needed to ensure that -
(i) both genders are equally represented in all institutions and agencies of government at every level; and
(ii) women constitute at least half the membership of all Commissions and other elective and appointed governmental bodies established by or under this Constitution or any Act of Parliament;
In light of the above, it is common cause thatimplementation of Constitutional provisions is mandatory.

1.2Statement of the problem

Zimbabwe's Constitution requires equal opportunities to be availed to males and females and appointments to high posts in the public sector to observe gender balance. Evidence shows that there are fewer women and girls who pursue science, technology, engineering and mathematics in high schools, colleges and universities. The Constitutional requirement is progressive because studies of women leaders across the economic divide show that women in high positions perform better than men and are more inclined to be more committed, honest and more ethical than men. Most corporate scandals are caused by men in men-dominated boards (Sifile et al, 2015).The problems faced by the girl child throughout the education value chain and progression ladder must be identified and issues involved should be examined and resolved so that the girl child can fully and confidently participate in all economic spheres on equal footing with men. If there are few females in areas of science, technology, engineering and mathematics, equality in appointments and gender balance in the involvement of women in economic spheres becomes difficult to observe. Advertisements for higher posts and those vying for political office will continue to attract fewer women who may not have the requisite experience, yet merit is a constitutional requirement.This study sought to bring to the fore the challenges being faced by Zimbabwean girls and women in accessingscience education and technology trainingwith specific focus on high school (A' level), tertiary (colleges) and higher educationinstitutions(universities) vis-à-vis the

requirements of the laws.There has not been much research which looked at the implementability of the laws on gender balance. This is the gap which this study sought to fill.

1.3 Research Objectives

The main objective of this review study was to examine the problems encountered by girls and young women in science education and training. The specific objectives of the study were:

1.3.1 To identify obstacles that hinder the fulfilment of constitutional provisions which require promotion of gender parity in all spheres including in science, technology, engineering and mathematics.

1.3.2 To analyse the factors that cause the girl-childrenwho initially study science subjects at secondary school in large numbers only to drop these when they progress to high school, college or university.

1.3.3 To identify strategies to use in motivating girl-children to increase their uptake of science and technology in high school, colleges and universities.

II. Literature review

2.1 The education system in Zimbabwe

Zimbabwe's education system is highly regarded the world over for producing world-class graduates. The education system has two distinct routes; the formal education route and the informal route which is based on Lifelong Education under the 'cradle to grave' learning continuum as represented by the two extreme ends of the diagram below whichis in tandem with the recommendations of the 1999 Presidential Commission of Inquiry into Education and Training (CIET).

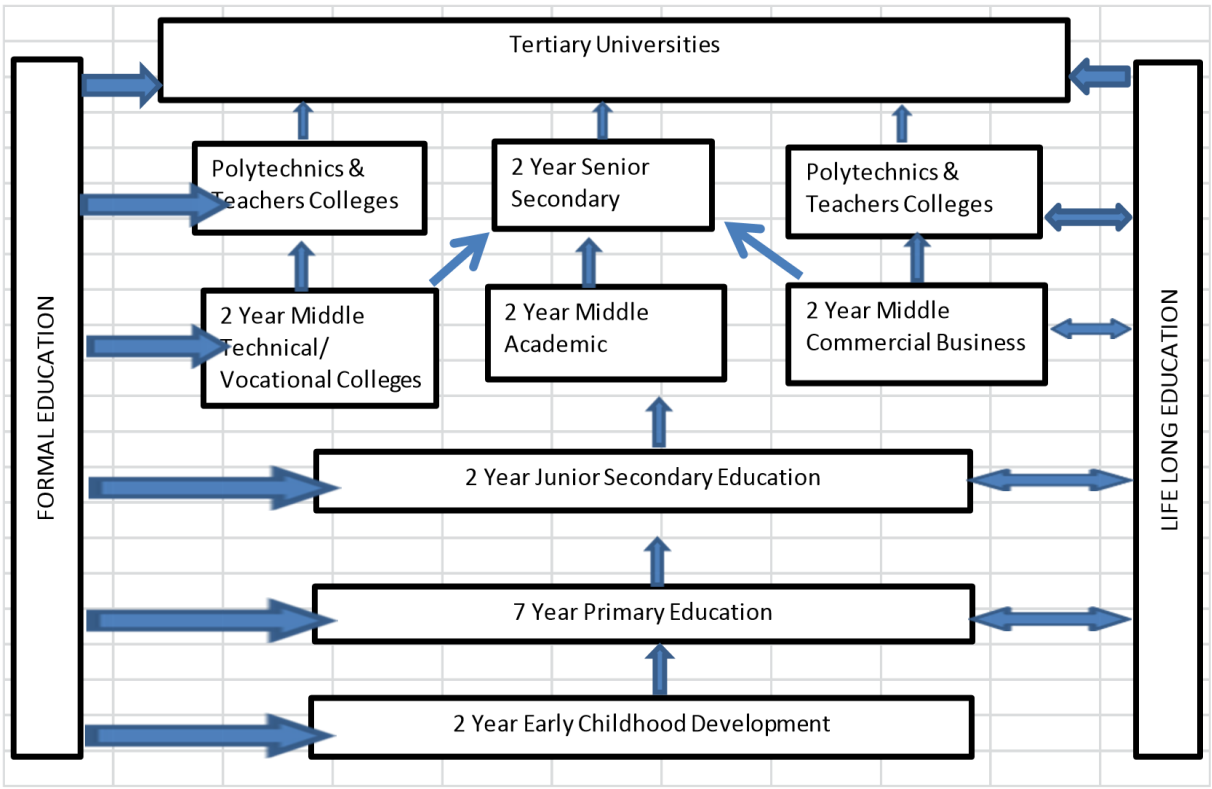


Figure 1.1: Structure of the Education System in Zimbabwe

Source: Government of Zimbabwe *(Adopted from the Report of the Presidential Commission of Inquiry into Education and Training - 1999)*

The study concerned itself with the formal education route and placed special emphasis on the top tiers where the disparity in the number of females and males pursuing sciences is more glaring.

2.2 Understanding the magnitude of the problem of gender imbalance in the access toscience education and training

2.2.1 Efforts by the Government of Zimbabwe towards achieving gender parity

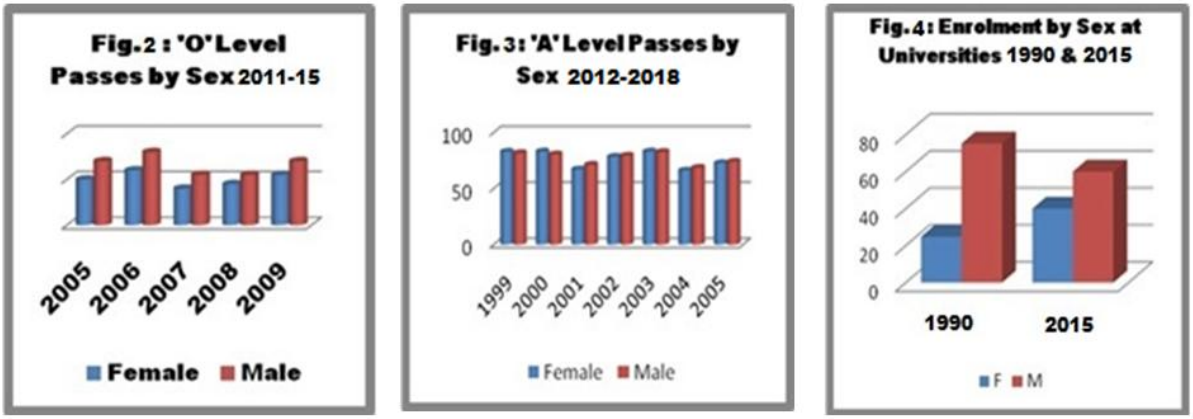
Over the years since independence, theGovernment of Zimbabwe has displayed political will to move towards gender parity by taking various measures which include domesticating the international, continental and regional conventions and protocols for the protection of women's rights and gender parity through the

enactment of various pieces of legislation. To this end; the Constitution of Zimbabwe (2013), Matrimonial Causes Act (1987); Maintenance Act (1999); Administration of Estates Act (1997); Sexual Offences Act (2001); Education Act (2004); Labour Act, (2005), Land Reform (2000), National Gender Policy and the enactment of the Zimbabwe Gender Commission Act [Chapter 10:31] No.7 of 2015 to mention but just a few andhaving the Ministry of Women Affairs, Gender and Community Developmentsince independence are some of the measures which support gender balance.Zimbabwe took measures to achieve MDG Goal No. 3 on promotion of gender equality and empowerment of women and SDG Goal No. 5 on gender equality. Suffice to state that while a lot has been achieved, a lot still remains to be done to ensure that women are taking part in economic development in equal terms with men. Ensuring that thereincrease in the numbers of females taking part in science, technology, engineering and mathematics education and training in high schools, in colleges and universities is one area needing focus.

United Nations Girls' Education Initiative (UNGEI) Report (2010) states that unlike in other countries in Sub-Saharan Africa, gender parity has been achieved in Zimbabwe in primary and secondary school enrolments with an impressive fluctuating gender parity index (GPI) of between 0.96 and 0.98. Again, breaking the trend in most countries of Sub-Saharan Africa, girls at primary level, do better even in traditionally "male" subjects like mathematics (Chirume et al, 2009)**.** On the other hand, consecutive Zimbabwe Schools Examinations Council (ZIMSEC) performance statistics show that at primary, girls perform better in public examinations than boys (ZIMSEC, 2010). However, the situation changes when it comes to O' level public examinations as boys have consistently been outperforming girls since 1999 by a wide margin.

2.2.2 Gender imbalance in high school and higher education

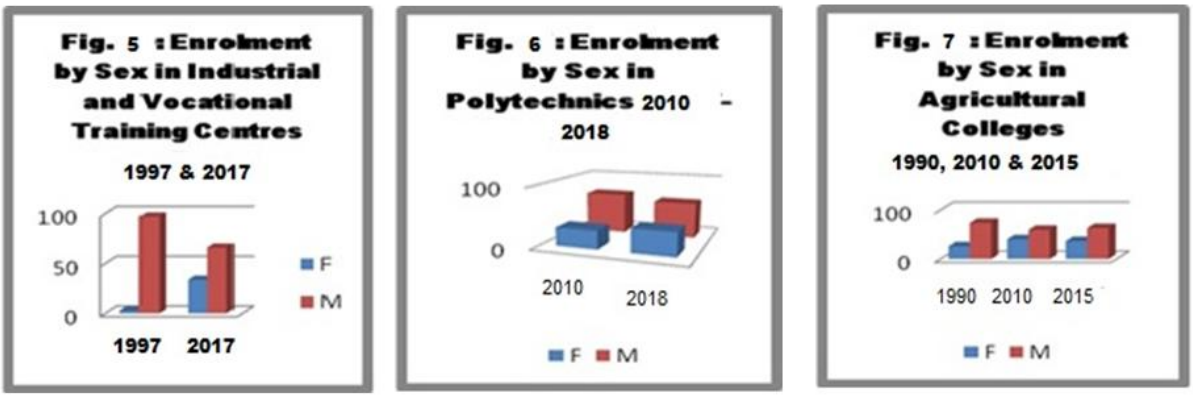
At 'A' level the trend is not so clear, as ZIMSEC statistics show that more girls performed marginally better than boys in 1999, 2000 and 2003, with boys outperforming girls in 2001, 2002, 2004 and 2005 (ZIMSEC, 2015). While one would conclude that this is a healthy performance balance, what is worrying is that at A' level, very few girls take up sciences. The subject by subjectcomparison and analysis of ZIMSEC A' level enrolments shows that most girls including those who did well in science and mathematics at O' level prefer Arts, Commercials and Humanities when they proceed to A' level and they shun science-related subjects. The Figs below illustrate the trends in the pass rates and enrolments by gender:



Source: United Nations Girls' Education Initiative (UNGEI) Report

The worrying trend where fewer girls choose sciences at A' level limits the girl child's choices at college and university creating a huge disparity between the number of girls and boys pursuing science, technology, engineering and mathematics careers at colleges and universities (GoZ, 2010).

The Figures 5 to 7below show that there was wide disparity between males and females in colleges. The trends continue except in Teacher Training Colleges which were feminized as from 2009.

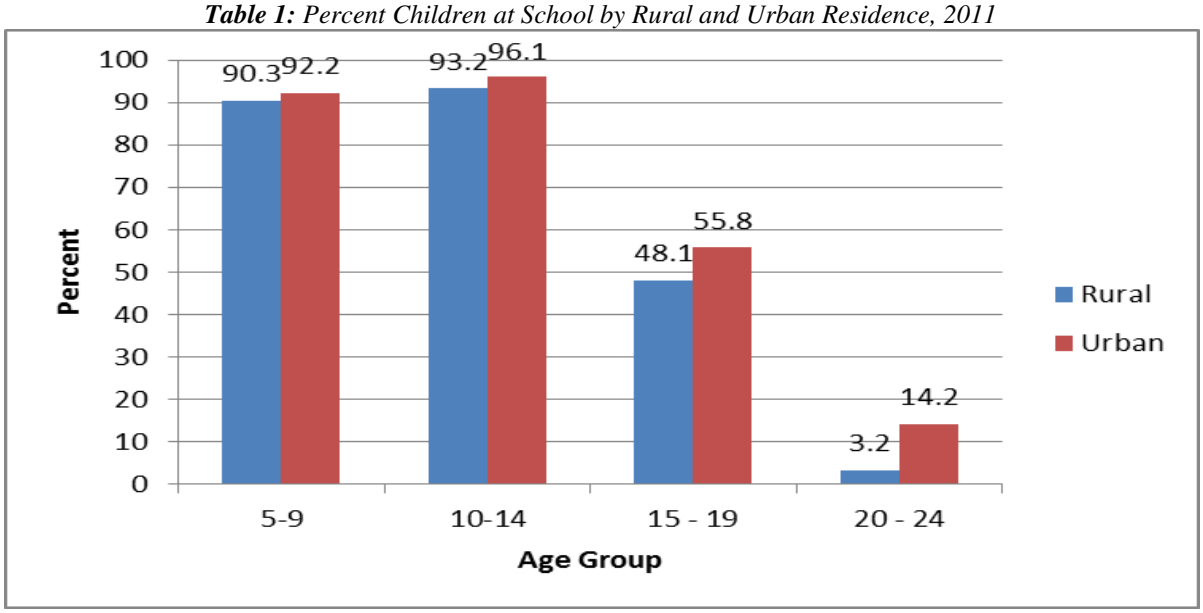


Source: Ministry of Higher and Tertiary Education, Innovation, Science and Technology Development Report

2.2.3 The Urban and Rural Dichotomy

The table below shows that urban students enjoy more access to education including science education than their rural counterparts, an anomaly which should be addressed. As shown on the Table, the disparity was more pronounced among those aged 15 years and above and these include the high school, college and university cohorts of the girl child.

Table 1: *Percent Children at School by Rural and Urban Residence, 2011*



Source: Ministry of Primary and Secondary Education

Table 2: *Enrolment in Secondary Schools in Zimbabwe by Form and Sex, 2009- 2012*

	2009		**2010**		**2012**	
	Males	**Females**	**Males**	**Females**	**Males**	**Females**
Form 1	101 034	103 650	112 196	114 669	116 324	120 740
Form 2	96 628	97 498	105 281	108 209	108 078	110 586
Form 3	89 135	87 750	99 628	98 707	114 215	109 791
Form 4	82 743	77 701	93 987	85 706	97 891	90 332
Lower sixth	11 788	8 716	10 511	8 833	19 055	15 311
Upper sixth	14 877	10 733	14 218	10 863	17 357	13 454
TOTAL	**396205**	**386048**	**435821**	**426987**	**474276**	**460214**

Source: Ministry of Primary and Secondary Education

Table 2 above shows that while there were more girls than boys in school from Form 1 up to 2012 as in other years, the number of girls became less than boys from Form 3 right up to Upper 6 in all the years under review. Further analysis of the trends showed that most girls who dropped out were those pursuing sciences and those from rural areas.

Table 3 *Enrolment in Technical Colleges in Zimbabwe by Gender 2005 to 2012*

	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Male	9 651	9 101	7 721	7 946	7 055	8 648	9 724	11 125
Female	5 470	5 260	5 429	5 098	4 568	4 594	7 145	7 370
Total	**15 121**	**14 361**	**13 150**	**13 044**	**11 605**	**13 242**	**16 859**	**17 432**

Source: Ministry of Higher and Tertiary Education, Innovation, Science & Technology Development (2013)

Table 3 above shows that there were glaring disparities between males and females in Technical Colleges throughout the years and this was caused by having fewer girls opting to pursue science careers and the low numbers of females with science passes at O' level.

Table 4: *Enrolment in Vocational Colleges in Zimbabwe by Gender 2005-2012*

	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Male	980	671	699	481	579	887	1 288	1 559
Female	127	58	83	247	186	129	231	260
Total	**1 107**	**729**	**782**	**728**	**765**	**1 016**	**1 519**	**1 807**

Source: Ministry of Higher and Tertiary Education, Innovation, Science & Technology Development (2013)

Vocational Colleges in Zimbabwe have very low numbers of female students. This was attributed to cultural stereotypes that technical practical careers are for men and the low numbers of females with science passes at O' level.

Table 5: *Enrolment in Zimbabwean universities by gender 2006-2012*

	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Male	33 729	32 977	34 524	29 456	30 536	30 132	33 264
Female	20 596	21 867	24 771	18 957	23 011	22 963	26 891
Total	**54 325**	**54 844**	**59 295**	**48 413**	**53 547**	**53 095**	**60 143**

Source: Ministry of Higher and Tertiary Education, Innovation, Science & Technology Development (2013)

As at January 2020, Zimbabwe had 13 registered state universities and 7 private universities all of which had adequate vacancies for female students with passes in sciences. Enrolment in science-related areas are undersubscribed by females across universities and the disparity between male and female is very high in sciences,mathematics, engineering and technology degree programmes with female students being in the minority throughout the years. To further clarify this point, the University of Zimbabwe's (UZ)case was used on the table below:

Table 6: *Enrolment of students in Final Years of study at the UZby Gender - 2015*

	3rd Year		**4th Year**		**5th Year**	
	Male	Female	Male	Female	Male	Female
Faculty of Agriculture	71	42	7	1	0	0
Faculty of Arts	233	263	0	0	0	0
Faculty of Commerce	387	199	294	126	0	0
College of Health Sciences	248	173	153	90	145	60
Faculty of Education	13	18	0	0	0	0
Faculty of Engineering	97	8	86	8	0	0
Faculty of Law	54	52	51	51	0	0
Faculty of Science	82	21	1	2	0	0
Faculty of Social Studies	419	354	59	69	0	0
Faculty of Vet Science	19	14	15	5	20	13
Total	**1 623**	**1 144**	**666**	**352**	**165**	**73**

Source: Ministry of Higher and Tertiary Education, Innovation, Science and Technology Development (2016)

At the University of Zimbabwe like in all other universities in Zimbabwe, the enrolment of females was lower than that of the males in all faculties except in the faculties of Arts and Social Studies. If promotion in the world of work is to be based on merit, and if equal opportunities were to be accorded to both males and females as required by the Constitution, gender disparity will continue to exist because there are fewer females who pursued sciences, technology, engineering and mathematics.

The National University of Science and Technology as the name implies, is predominantly a science and technology university and the university has been grappling with issues gender imbalance since formation. The table below illustrates the point:

Table 7: *Enrolment in Final Years at the National University of Science and Technology (NUST)*

	3rd Year		4th Year		5th Year	
	Male	Female	Male	Female	Male	Female
Faculty of Applied Sciences	102	63	118	86	0	0
Faculty of Built Environment	40	11	68	14	25	4
Faculty of Commerce	82	62	160	79	0	0
Faculty of Communication & Information Science	29	64	37	51	0	0
Faculty of Industrial Technology	138	41	127	31	82	21
Faculty of Medicine	0	0	0	0	0	0
Total	391	241	510	261	107	25

Source: Ministry of Higher and Tertiary Education, Innovation, Science &Technology Development (2015)

While all universities in Zimbabwe offer science programmes, NUST, CUT, BUSE, MUAST, LSU, GSU and MUAS[2] are all state universities whose mandate is science, yet there are fewer students studying A' level sciences as stated earlier. The result is that the enrolments of females will be low across universities. If this situation is juxtaposed to the world of work, giving equal opportunities to males and females will continue to be difficultto implement as in trying to equalize the unequal. Consequently, in commerce and industry as in the public sector, some advertised posts will not have any female applicants forcing employers to ignore the dictates of the Constitution. This is not desirable. Such supervening circumstancescaused by the supply-side of graduates is where the problem should be addressed.

2.3 Obstacles which female students encounter in their quest to pursue science, technology, engineering and mathematics education and training

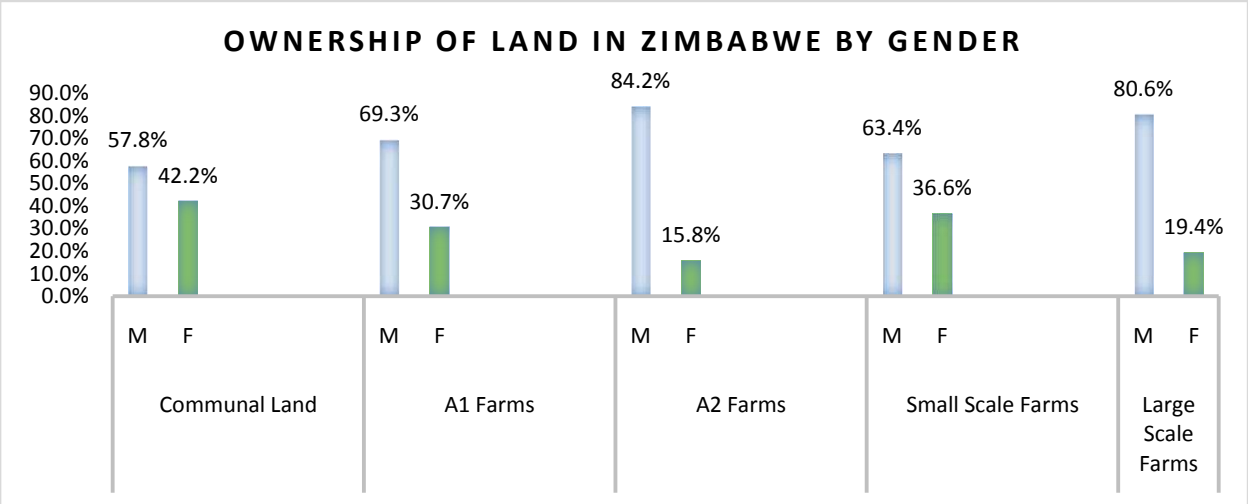
2.3.1 Poverty

UNICEF (2019) states that the biggest barrier to girls' education and career development in Zimbabwe is poverty. For instance, a study carried out by the Girl Child Network in 2014 revealed that seventy-two percent of the girls living in rural areas use soft bark tissue from trees during menstruation and do not attend school as a result of the indignity they face during their menstrual days. Under such circumstances, exercising independent decisions to pursue science and mathematics is not treated as priority.Poverty is the greatest barrier to accessing an education of choice and overcoming this barrier by investing in girls and women is a proven way of improving the health and wealth of entire nations (CAMFED, 2019). Girls bear the brunt of economic problems such as lack of water, lack of electricity, lack of family income and droughts, not to mention AIDS and the Coronavirus pandemic (Covid-19). The results of these hardships lead to impoverished families. Consequently, girls are viewed as a source of income through early marriages or vending. This drives parents especially in remote rural areas to prefer not to invest in girls' education. These factors create unique obstacles for girls seeking to pursue a qualification in science, technology, engineering and mathematics (UNGEI, Report 2010)

Tilling land profitably is a skill and a science which is acquired through practical involvement and training. If females shun sciences and technology including agriculture, then equal opportunities in agriculture will not be achieved in contravention of the legal provisions. Poverty could be reversed by achieving parity in land ownership, but the table below shows otherwise:

[2] NUST (National University of Science and Technology), CUT (Chinhoyi University of Technology), BUSE (Bindura University of Science Education), MUAST (Marondera University of Agricultural Sciences and Technology), LSU (Lupane State University), GSU (Gwanda State University) and MSUAS (Manicaland State University of Applied Sciences)

Table 8: *Land Ownership*



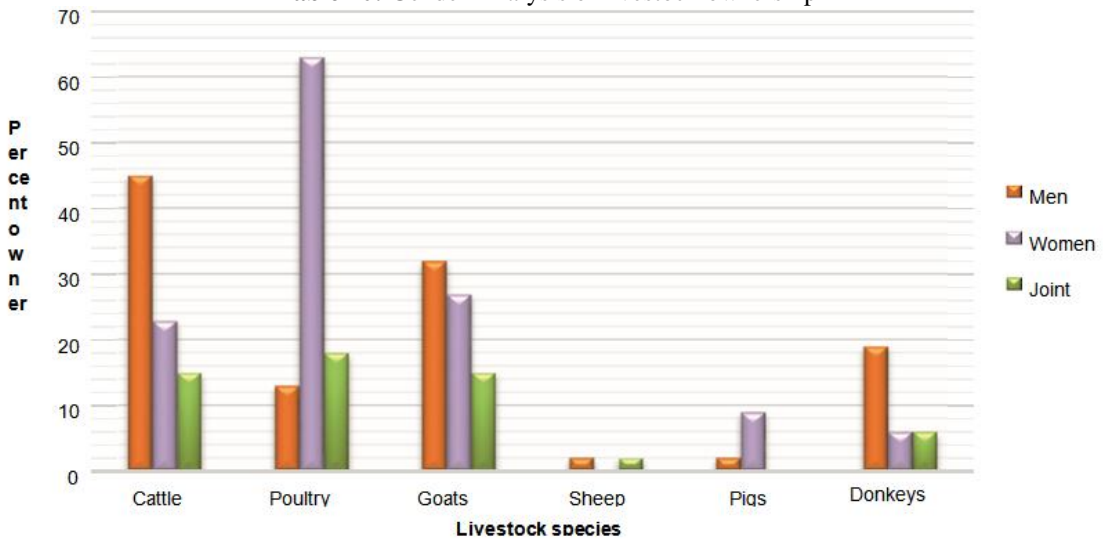
Source: Adopted from Zimstat, April 2013.

The above Table shows vast disparities in land ownership. Poverty which bedevils the feminine sector in society is further entrenched by lack of ownership of resources and the means of production through cultural stereotypes as again exemplified on the table below:

Table 9: *Livestock ownership patterns in Zimbabwe*

Farmer loan access by gender in 2012		
Source of Funding	**Male**	**Female**
Agribank	97	0
Cargil	1572	143
GMB	3204	867
Others	7036	1340

Table 10: Gender Analysis of livestock ownership



Source: Gender analysis of livestock, 2015 FAO

One way to turnaround gender disparity among males and females is to avail equal opportunities through access to loans. The tableabove shows a gloomy picture of the situation on the ground except in ownership of poultry, thereby condemning the girl-child to a vicious cycle of lifetime poverty, a thing which must be corrected.

2.3.2 Cultural gender stereotypes

During early stages of childhood right up to adolescence and beyond, parents and society are guilty of instilling a culture of masculine superiority stereotypes about science and technology (Chabaya et al 2009).

Froma young age, children are made to believe that most technical work which requires hands-on skills and training is for the males and girls must focus on finding a partner to marry rather than pursue education in male dominated careers. Peer pressure and lack of adequate role models also weigh heavily against girls' desire to pursue science and technology careers.

As they grow; children learn about gender in early childhood as they encounter gendered expectations and roles(Eccles, Jacobs, &Harold, 1990). The feminine gender role stereotypes are fostered to orient girls to be communal. Girls are taught to be socially skilled and helpful while boys are taught to be technically skilled and innovative. Girls are expected to focus on family and bearing children, and to gravitate towards activities that emphasize interpersonal relationships (Konrad, Ritchie, Lieb, &Corrigall, 2000). On the other hand, masculine gender role stereotypes orient boys to beargentic; that is acquire mastery, skills, competence, to explore the physical world, tinker, figure out how things work and gravitate towards activities that emphasize problem-solving, status, and financial gain. Most textbooks which students study, besides being written by men are littered with men heroes who won wars, discovered, invented, manufactured, developed this and that and started religions and so on. It is such content which cultures the girl child to feel inferior to the boy child. Such masculine gender successesalign with popularcultural representations of mathematics and science, which are portrayed as not suitable to the female folk(Buck, Leslie-Pelecky, & Kirby, 2002).

Parents' expectations influence children's academic trajectories. The more parents encourage their children's after-school science and technology activities, the more they focus on science and technology in their education and training. If parents provide activity-related materials to children, and participate with them, the more children become interested in science and technology (Simpkins, Davis-Kean, &Eccles, 2006). Parents'beliefs and confidence about their children's mathematics ability and efforts better predict children's confidence in mathematics (Frome&Eccles, 1998). On the downside, on average,mothers apply gender stereotypes about mathematics and scienceto their children more than fathers do (Yee &Eccles, 1992). In a nutshell, parents play a critical role in dissuading girls from pursuing science and mathematics and this area needs attention. They are critical early socializers of their children's academic interests.

Peer acceptance is a special concern during adolescence (Eaton, Mitchell, &Jolley, 1991). Same-sex friends' interests go a long way in shaping and influencing adolescent girls' pursuit of science and technology. Usually from middle to high school,students' decisions to take advanced mathematics and science classes are linked to their counterparts course-taking the previous year (Riegle- Crumb, Farkas, & Muller, 2006). Collaboration is particularly crucial, when students exchange ideas, they justify their own position, gain exposure to other ways of thinking, and experience self-confidence, mastery, and successful task completion (Durik&Eccles, 2006; Patrick*et al*,2007; Ryan & Patrick, 2001). On the flip side, while the social environment does not encourage girls to pursue science and mathematics, the boys are encouraged and inspired that their success in mathematics, technology and science means they are 'real' man (Ames, 1992).

2.3.3 Lack of inspiration for the girl to take up sciences

Collaborations between high schools and science and technologydepartments in colleges and universities has been minimal with some universities remaining ivory towers instead of aiding girls from lower levels at a tender age to pursue science, technology, engineering and mathematics(Dasgupta,Hunsinger&Scircle, 2014).Relationships between high school education and tertiary institutions which bring the girl child face-to-face with real scientists,engineers, mathematicians and technology creators who are faculty and graduate students in science and technology departments should be encouraged. It is envisaged that funding agencies should recognize outreach by offering grant support to the girl child. The rural girl child is most affected as there are no laboratories to offer training in rural secondary schools to build appreciation. In such instances, donor agencies and philanthropic organizations could intervene and cause the construction of laboratories in rural secondary and high schools (Stout*et al,* 2011)

Access to role models and mentors influences successful professional development. Young adults identify with successful female role models whose presence allows them to think: "If she can be successful, so why can't I" and "I want to be like her." Typically, however, female college studentshave few same-sex role models. Faculty staff in science, mathematics, engineering and technology (especially professors) are 4 times more likely to be men than women (NSF, 2013).

The primacy of belonging and women's lack of fit states that for decades, social psychological research has noted the fundamental importance of feeling accepted and welcometo pursue science goals effectively(Baumeister& Leary, 1995). Applied to learning environments, when students do not feel that they belong to an academic setting, they become disengaged and unmotivated,resulting in low academic performance (Freeman, Anderman& Jensen, 2007). This happens when a girl child finds herself in a lower sixth form science class dominated by boys. Feeling out of place is especially common in such circumstances and the probability of dropping out or failing increases(Cheryan*et al*, 2009). This assertion is supported by Nosek, Banaji, & Greenwald (2002) who state that the big reason why women feel out of place in science and technology classes

is because of the widespread stereotype that science, mathematics, engineering and technologyare "guy things". As a result, women and girls who believe in this stereotype tend to underperformin mathematics-intensive fields (Miyake *et al*., 2010).

In a typical high school, college or university; science, mathematics, engineering and technology class, men outnumber womenby at least 3:1. Given such skewed gender ratios, female students often find themselves to be one of a few women in a class or team.Being a token or solo makes people feel overly visible or "boxed in" by stereotypes about their group, and pressured to feel out of place leading to underperforming. (Kanter, 1977).

2.3.4 Lack of sensitivity of the girl child's plight by employers in the world of work

The table below shows high disparities among male and females with females being in minority except in the Agriculture labour force where most women are employed as unpaid family workers.

Table 11: *National Employment in selected sectors by gender*

Issue	MALE	FEMALE
Labour force participation	74.3%	25.7%
Agriculture labour force	30%	70%
National Assembly (Parliament)	68%	32%
Senate membership	52%	48%
Local authority	82.3%	16.7%
Agricultural college lecturers	60%	40%
Managers in private sector (2011)	79%	21%
Executives in universities *(VC, PVC, Registrar & Bursar)*	86%	14%

Source: Compiled from varied sources including Zimbabwe Country Gender Assessment Report, 2013

III. Methodology

The study was a review. It involved collection and analysis of data from various hard and soft copy sources including academic literature, country reports, strategic frameworks, press reports, statistical information, legislative statutes, policies, UN documents, and other relevant government documentations. Various secondary and tertiary sources of data were reviewed. Desktop data analysis and synthesis was used to understand the phenomena at hand and to draw informed inferences and conclusions. Statistical analyses of data collected in censuses and authentic regulatory bodies such as theZimbabwe Statistics (ZIMSTAT), Zimbabwe Examinations Council (ZIMSEC) and the Zimbabwe Council for Higher Education (ZIMCHE) were used and trends were noted, examined, analyzed and synthesized to provide an overview of the true situation of the problems encountered by the girl child and women in their endeavor to pursue science, technology, engineering and mathematics education and training.

IV. Research Findings

The study found out that the Government of Zimbabwe has made commendable strides towards achieving gender parity among men and women but it was apparent that a lot still needs to be done to achieve gender equality and to fully conform to the lawsespecially the Constitution.

Given that merit is a derivative of education, training and experience; the girl child and women continue to be few in highly specialised areas such as in science, technology, engineering, mathematics and in high posts across the economic divide in contravention of the constitutional provisions.

It was found out that even if employers were to earnestlytry to implement gender parity in top appointments and in boards bankingon the few numbers offemales who have made it especially in science, technology, engineering and mathematics, the few females with merit would be so overwhelmed with high positions, responsibilities, roles and recognition causing inefficiency and incompetence.

The study found out that the girl child participates well in science and mathematics in equal or even higher numbers than boys in primary and secondary school where the study of science and maths is compulsory. However, when it came to high school, college and university levels, where participation in science, technology, engineering and mathematics becomes a choice, many femalesshun STEM areas opting to pursue Arts, Commercials or Humanities. On the other hand, males at high school, tertiary and higher education levels tend to do everything possible to be enrolled in STEM areas which they view as prestigious and highly rewarding in the world of work. It is such a possibility attitude which lacks among many women and girl children.

The study also concluded that the girl child and young women are faced with a plethora of problems which hinder them from enjoying science, technology, engineering and mathematics from high school level with the number one enemy being poverty.

It was noted that the problem of having fewer females pursuing science areas had its roots on cultural stereotypes where the science fields are viewed as male domains. The education system where teachers and

society view science areas as difficult also contributed to frightening the girl childfrompursuingscience programmes.

The strict school examinations system in Zimbabwe which defines success as in achieving high grades tended to frustrate the girl child who would rather aim for 15 points in vernacular subjects and other Arts areas than pursue science and mathematics which they have been made to believe are difficult.

The study also found out that most girl children write O' level science and mathematics because the subjects are compulsory; a good number of thosewho passdropthe subjects when they proceed to lower sixth form in preference of Commercials, Arts and Humanities - a thing which then shapes and affects their choices in colleges and universities.

V. Recommendations

5.1 The study recommends Government and non-state players to increase advocacy activities to help inspire the girl child and educate society to break gender stereotypes which have negatively affected the progression of the girl child and women in science.

5.2 Government and funding partners should create a fund to help sponsor girl children from disadvantaged backgrounds so that they may pursue their goals in science, technology, engineering and mathematics education and training. Society should make sure no girl child suffers from lack of funds to pursue education, especially sciences. The tendency has been to sponsor primary level and neglecting high school, college and university levels.

5.3 Effective career guidance is needed to help those students who pass mathematics and sciences at O' level to choose sciences for their lower sixth form studies.

5.4 There should be training of frontline staff in education who handle the girl child and women (teachers, school heads, college principals, and lecturers) so that they use exciting teaching methods which demystify and simplify concepts to end the belief that sciences and mathematics are difficult subjects.

5.5 There should be wide use of trained female role models who have made it in male-dominated science fields to addressand adopt female students from a tender age right up to universityin order to inspire girls and women to pursue careers in science, technology, engineering and mathematics careers.

5.6 The huge disparity between males and females in the uptake of science, technology, engineering and mathematics education and training especially from high school right up to tertiary and higher education levels should be addressed through affirmative action.

5.7 Equitable distribution of resources by Government and non-state players in building and equipping science laboratories across the country especially in rural areas should be prioritised.

Areas for further study

The review study was based on secondary and tertiary sources of information as accessed through wide reading and document analysis. A study of the same problem based on data analytics and information collected from primary sources as to why female students who will have passed science and mathematics at O' level opt to drop the subjects when they get to high school, college and university would make interesting reading and go a long way in filling the remaining knowledge gap.

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