

Women in Engineering for Economy Recovery in Zimbabwe

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ABSTRACT— *Engineering is the application of scientific and mathematical knowledge as well as creativity for the development of solutions as well as for technology advancement. Previously the engineering field has been male dominated but of late women are taking up this discipline although the rate is still as low as 25%. The low uptake of these engineering fields by women therefore affects the output of women engineers into the society and consequently therefore failure to meet the engineering demands of our country. However, due to the women friendly policy implementation in Zimbabwe, involvement by women in engineering is increasing. Women engineers are helping ease problems of special skills shortage as well as lowering the gender imbalance that has existed in this field. Furthermore, participation by women engineers minimizes the employment shortage as well as re-boosting the economy in all fields such as academia, industry and entrepreneurship. Women engineers on the ground are working hard participating in the economic recovery of Zimbabwe but, there is need for more for an effective change. This is achievable through awareness campaigns and implementation of policies crafted to empower women.*

Keywords— Economy Recovery, Empowerment, Engineer, Women

1. INTRODUCTION

The word Engineer is derived from Latin roots *ingeniare*, which means to design or devise as well as *ingenium*, which means cleverness [1]. Engineering involves application of scientific knowledge, mathematics and creativity for the development of solutions to technical problems. Engineers are the practical minds that link science, technology and society and known to solve national problems related to technology. Women on the other hand, being naturally made creators and developers are increasingly pursuing careers in the engineering field and are also at the forefront in addressing economic recovery in Zimbabwe. Women form 52% of Zimbabwe’s population and previously they have been marginalized in terms of education, health, human rights, economic empowerment and decision making processes [2]. Globally there is a drive to empower women also encourage them to consider careers in science, engineering and technology [3-5]. An organization named “Organization for Women in Science and Engineering” founded in 1989, based in Trieste, Italy was also formed as part of this initiative. The organization was formed as a means of empowering and encouraging women to partake in the previously dominated male industry. This organization supports women with funding, grants, scholarships and short visits as a way of increasing the number of women in Science, Engineering and Technology especially from developing countries like Zimbabwe.

2. WOMEN’S ACCESS TO PRE-ENGINEERING TRAINING IN ZIMBABWE

Engineering disciplines available in Zimbabwe include Chemical Engineering, Chemical and Process Systems Engineering, Civil Engineering, Mining Engineering, Electrical Engineering, Mechanical Engineering and Metallurgical Engineering. Emerging disciplines in engineering are being implemented at the Harare Institute of Technology (HIT) in Harare, Zimbabwe, and these include Polymer Science and Engineering, Material Science and Engineering, Software Engineering as well as Financial Engineering [6].

2.1 Statistics of Women Enrolling for Engineering Degrees: Case Study HIT, Harare

The numbers of female students in sampled engineering degree programs at HIT indicated that female students enrolling in the degree programs are about 4 times lower as compared to the male students in the same field, with Industrial and Manufacturing Engineering having the lowest female intakes (see Figs 1-4). Increase in the number of females enrolling for Engineering programs is the way forward to address the shortage for engineers to address our economic challenges as the total number of engineers inclusive of the males will increase, hence also the fast tracking of economic recovery.

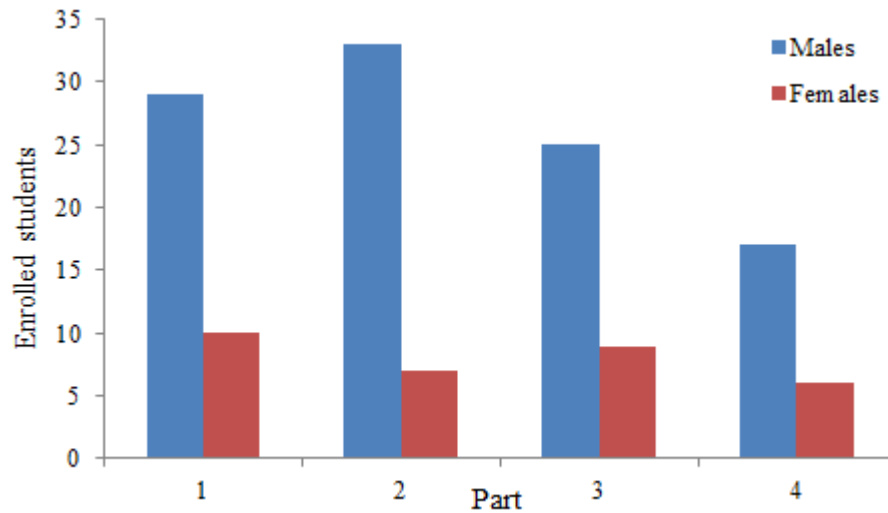


Fig 1: Current students' enrollment in the Chemical and Process Systems Department

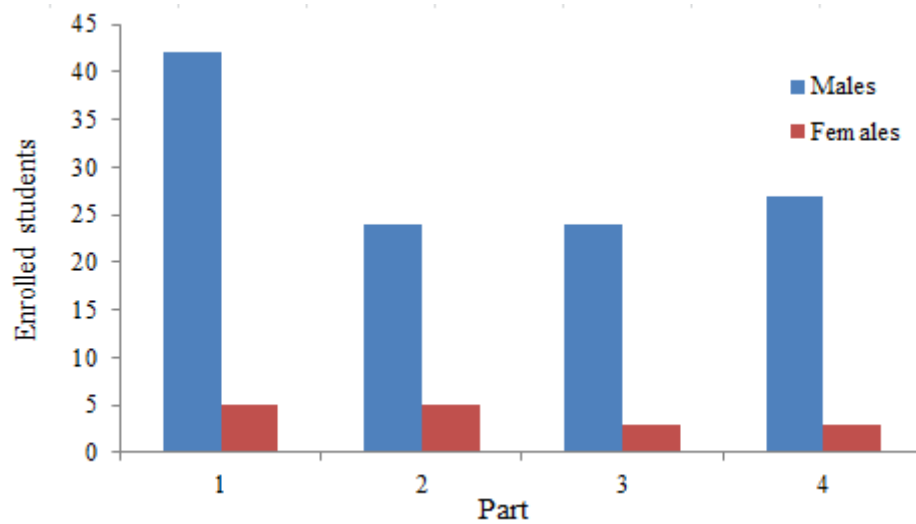


Fig 2: Current students' enrollment in the Electronics Engineering Department

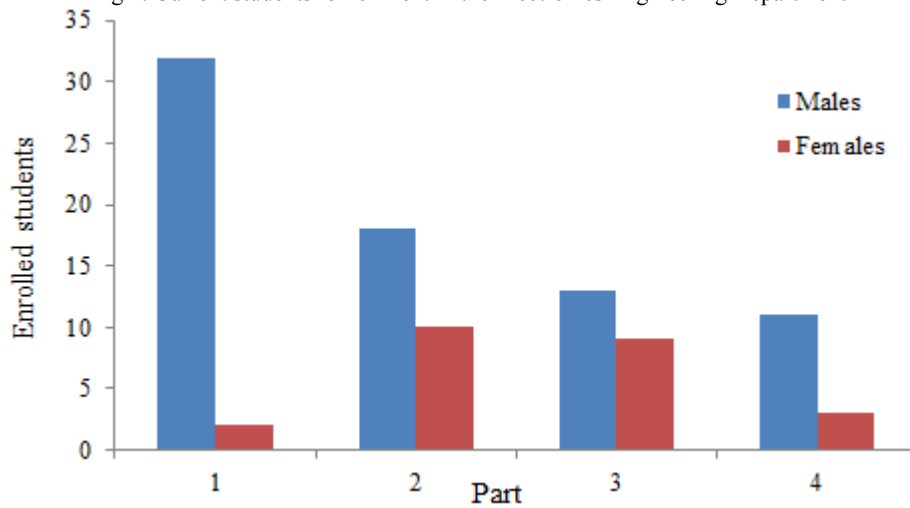


Fig 3: Current students' enrollment in the Financial Engineering Department

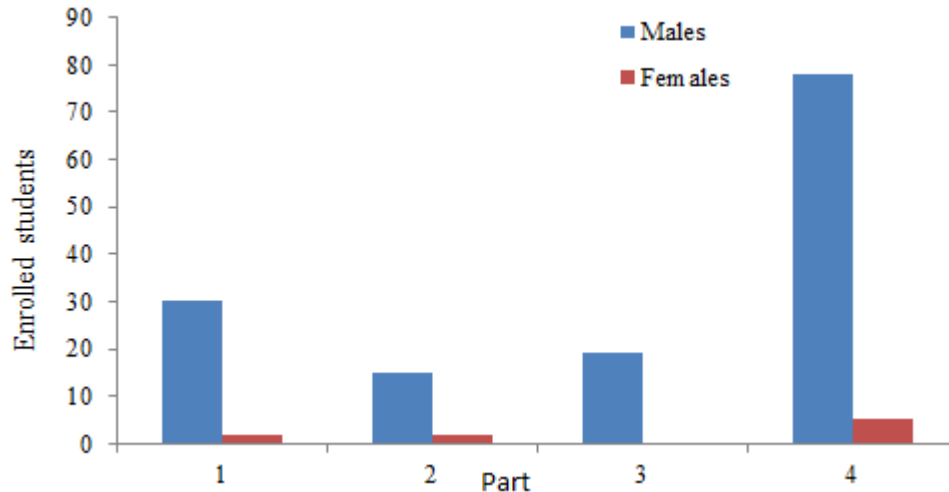


Fig 4: Current students' enrollment in the Industrial and Engineering Department

2.2 Statistics of Women Graduating with Engineering Degrees: Case Study HIT, Harare

In addition, the total number of female graduands in the Engineering disciplines has been significantly lower compared to the males, although growing (see Fig 5). Awareness campaigns and encouraging females to join these disciplines will be a solution for economy recovery as the number of graduate engineers will increase.

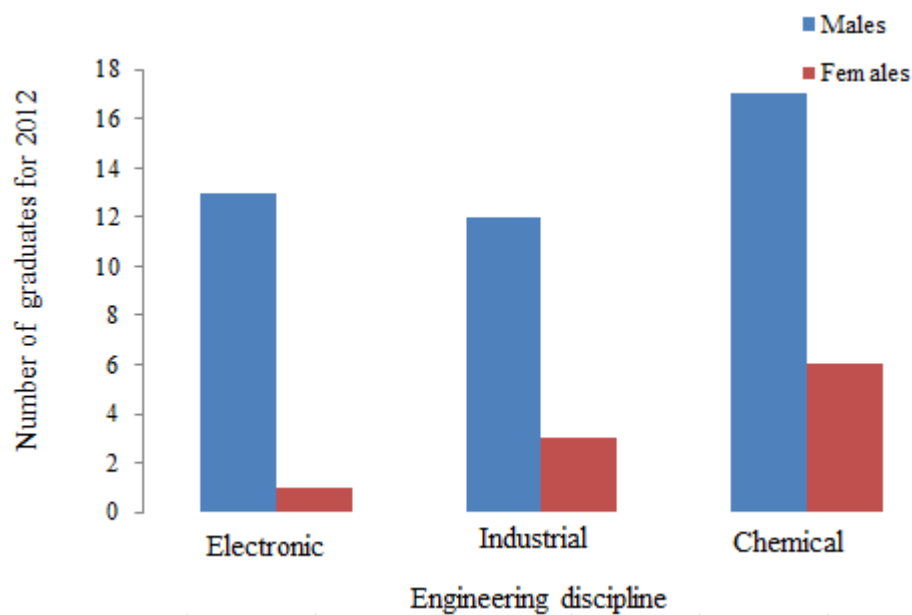


Fig 5: Comparison of male and female graduands from various Engineering disciplines

3. AWARENESS CAMPAIGNS AT SCHOOLS

Recently, HIT hosted a Woman in Engineering Open Day as a way of informing and encouraging the girl child to pursue engineering as a career. During the open day the girls from high school had a chance to learn from the women engineers who have successfully tackled the field either as academics, entrepreneurs or as women engineers in industry as a way of rallying the girls to consider careers in engineering [7].

4. ROLE OF SOCIETY IN PROMOTING WOMEN ENGINEERS

In general the society is supporting women in terms of equality and empowerment. This encourages women to join the engineering fields hence more women impacting on the economy recovery.

4.1 Zimbabwean Constitution

The new constitution adopted in 2013 has a strong support for women. Clause 3 (1) indicates gender equality as a founding value. In addition, Clause 4.7 (2) provides equality to both men and women thereby giving women equal opportunities in the engineering field. The clause also does not allow any discrimination based on the marital status of anyone. Clause 2.7 indicates that there should be a 50-50 representation amongst men and women and that women must be allowed to participate of the Zimbabwean economy by the government legislation and that the State must take strict measures to avoid gender discrimination. Furthermore, under Clause 4.16 (6), constitution indicate that any employed woman is entitled to at least 3 months on maternity leave with full pay, furthermore under Clause 4.16 (5) women and men are entitled to equal remuneration. The constitution allows women in professional fields like engineering with equal opportunities like men and at the same time allowing them to pursue their motherly role which brings a positive impact on our economy.

4.2 Role of Professional Institutions

The total number of Women Engineers registered and who actively participate in professional bodies such as the Zimbabwe Institute of Engineers (ZIE) and the Engineering Council of Zimbabwe is still lagging behind compared to the male engineers. For example the total number of Women Engineers actively involved in all the ZIE grades is 96% lower as compared to that of men (see Table 1) [8]. As part of the Engineers turning around the economy for Zimbabwe the women numbers need to significantly increase so that the contribution to economic recovery is also significant. This is achievable by enrolling more female students in the engineering fields at both universities and polytechnics.

Table 1: Membership statistics for males and females at ZIE.

Grade	Total registered	Active	Male	Female
Past president fellow	7	6	6	0
Honorary fellow	2	2	1	1
Fellow	102	70	68	2
Member	682	404	388	16
Associate member	112	33	33	0
Technician	357	119	119	1
Graduate member	349	320	294	26
Graduate technician	370	153	150	3
Member (Temporary)	188	188	182	6
Technician (Temporary)	44	44	43	1
TOTAL	2213	1339	1284	55

5. CAMPAIGNS AND POLICIES TO COMBACT CULTURAL PREJUICE AGAINST WOMEN

The Ministry of Women Affairs, Gender and Community Service have been very active in promoting women in the process of trying to address the economic challenges in Zimbabwe. The Honorable Cde Dr Olivia N, Muchena endorsed the Women’s Economic Empowerment Programme and indicated that the Government has realized that empowering women economically will address poverty and security rights in the home [9]. The Ministry went on further to avail a Women’s Development Fund in a bid to continually empower women so they can be part of the economy recovery phase [9].

In addition, the Government of Zimbabwe on the 19th of July 2012, launched the Broad Based Women’s Economic Empowerment Framework which promotes gender equality and empowerment of women in all sectors of the economy [2]. The Government of Zimbabwe recently introduced the Gender Responsive Economic Policy Management Initiative whose goal is to equip local policy makers, economists, budget officers and other development practitioners with the expertise and ability to mainstream gender aspects into economic development policy formulation [2]. Zimbabwe is among the five nations in Africa to introduce this initiative as a positive move to empower women. The Government of

Zimbabwe is also working with United Nations agencies such as UN Women, UNDP and UNFPA who have women empowerment at heart to make this initiative a success [2]. The UN has also articulated its support around laws, policies and frames established and implemented to ensure gender equality and empowerment of women and girls, progressing towards the achievement of Millennium Development Goal number 3 (MDG 3) which promotes gender equality and empowerment of women [10].

6. PROMINENT WOMEN ENGINEERS ADDRESSING ECONOMIC RECOVERY IN ZIMBABWE

Although Zimbabwe is still growing in terms of bridging the gender imbalance between men and women in engineering, there are several women engineers who are helping turn around our economy in a positive direction. The likes of Engineer Rujeko Masike, Engineer Memory Nyoni and Engineer Farai Mavhiya-Bhiza.

Engineer Rujeko Masike is an Industrial and Manufacturing Engineer. She is a Lecturer in this field as well as Chairperson of the Industrial and Manufacturing Engineering Department at HIT. Rujeko is helping in turning around the Zimbabwean economy by engaging herself in research, technology transfer and technology incubation [6]. She has done several works improving designs for sustainable development as well as positively impacting on female students who are enrolled at HIT as she is a role model in her position as the departmental manager.

Engineer Memory Nyoni, is a Mechanical Engineer and Technical Director for the Rural and Electrification Agency (REA). REA is a statutory body governed by the Rural Electrification Fund Act (Chapter 13:20). REA was formed due to the high priority attached to rural infrastructure in the post-independence era which included rural electrification [11]. REA is involved in projects such as obtaining renewable energy from solar projects and biogas production as an alternative fuel sources as well as the provision of services for designs and installations of generators. The work Memory's involved in, is assisting in turning around Zimbabwe's economy in a positive way.

Engineer Farai Mavhiya-Bhiza is an Electrical Engineer, Engineering Council of Zimbabwe Board member as well as the Associate Director for ARUP. ARUP is an independent firm of designers, planners, consultants, engineers and technical specialists offering a broad range of services [12]. This work that Farai is involved in, affects the recovery and improvement of Zimbabwe's economy.

All the job descriptions listed above, have been male dominated before but women engineers are becoming prominent in them and thereby turning around our economy.

7. CONCLUSION

Women Engineers are contributing to turning around the economy of Zimbabwe in a positive direction and are gradually occupying strategic positions in key areas that determine Zimbabwe's growth. Although there is still need to increase numbers in this field, to bridge the gender imbalance and empower women, our Government is supporting Women Engineers to turn around the economy through policy implementation.

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My fellow female engineers: Rujeko, Farai and Memory for raising our flag so high.

*About the author

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