Original Research Article

Transforming rural female learners' under-representation in Advanced Level science subjects in Zimbabwe

Abstract

This is a positional paper, which endeavours to indispensably provide an emancipatory view of gender disparity, with a particular focus on rural female learners' progression in Advanced Level science subjects. This discussion was guided by a framework derived from feminist, and social learning standpoint. The methodological approach used to generate and analyse participants' lived experiences comprised of the transformative paradigm, and qualitative approach. The sample for this study comprised of forty-five purposively participants who were doing sciences and other subjects at Advanced Level. Data was generated the through literature method, focus group discussion and in-depth interviews. Analysis of the sourced data was narrative in nature buttressed by direct citations. From the rural female learners' experiences, it was revealed that appropriate information propagation augments their consciousness about gender issues in their progression in Advanced Level science subjects. Also, researcher noted that there was a need for an evidence-based policymaking process, which acknowledges participants' socio-cultural backgrounds in crafting gender-related policies to promote their progression in Advanced Level science subjects. Hence the need for a policy transformation that enforces gender-neutral approaches to information promulgation with the belief of empowering rural female learners in their progression in Advanced Level science subjects. The conclusion, therefore, is that transformation of rural female learners' mind-sets towards sciences was of utmost value in bridging the gender disparity gaps in their progression in Advanced Level science subjects. As a recommendation, researcher proposes the need for the inculcation of a gender-neutral, and sensitive approach in a bid to transform rural female learners' under-representation circumstances in Advanced Level science subjects.

Keywords: Advanced Level; rural female learners; science subjects; transforming; under-representation

1. Introduction

The major concern in basic education is ensuring that rural learners stay in school to acquire knowledge, skills, and values in their areas of interest (Ali, 2017; Mandina, 2013). It is against the background that gender equality is perceived, as when all rural learners have equal prospects in terms of social, cultural, and political advancements based on learner-centred approaches (Makura 2009; Mapolisa & Madziyire 2012; Sahin, 2014). However, this should be viewed against the background where parents socialize their children, and notwithstanding the gender-related opportunities presented to either rural female or male siblings (Endendijk, Groeneveld & Mesman, 2018). For instance in Zimbabwe, like in any other country in the sub-Saharan Africa operating under patriarchal epitomes, cultural belief systems have affected gender interactions, and its indulgence in transforming rural females' under-representation in various spheres of life has been at a slow pace (Bhana, 2018; Masvawure, 2010; Okafor, Akinwale & Doyin-Hassan, 2007).

With this in mind, it has been noted that education, and training information from sub-Sahara African nations show that rural female learners continue to lag in Advanced Level science subjects (Chikuvadze, 2020; Masanja, 2010). As a way of giving rise to a strong mathematics, and science foundation, Zimbabwe's Ministry of Primary and Secondary Education made progression in these subjects mandatory up to Ordinary Level (Herzig, 2004). However, the number of rural female learners making headways in Advanced Level science subjects is significantly subdued compared to males, and worse still in rural secondary schools (Gudyanga & Gudyanga, 2013; Gudyanga, Mandizvidza & Gudyanga, 2016; Samkange, 2015).

In this regard the researchers cannot afford to ignore rural female learners' under-representation in Advanced Level science subjects, against the background of the need to accomplish sustainable scientific, and technological advancement in underprivileged societies (Aguele & Agwagah, 2007; Mandina, Mashingaidze & Mafuta, 2013). Therefore, sets up the foundation for the researchers to be apprehensive with the current status quo in Advanced Level science subjects in rural secondary schools in one province in Zimbabwe. In this context, researchers, therefore, bring to the forefront that although there have been some historic efforts to close the existing gender gap in Advanced Level science subjects there remain an unanswered question: Is gender equality a dead political concern? It is against this background that the United Nations General Assembly adopted the Sustainable Development Goals, with Goal number 5 focusing on gender equality, and empowerment of all females (Azcona & Bhatt, 2020; Mwamwenda, 2014; UNESCO, 2017). As a follow up to the demands of this goal, governments worldwide have tried to create equal platforms for the advancement of rural female, and male learners at all levels of education (Chikunda & Chikunda, 2016; Chikuvadze & Jacobs, 2021). For instance, Zimbabwe has made significant strides in amending and enacting policies (the constitution, national gender, affirmative action policies, among others)

to advance the gender equality, and equity objective in different spheres of life (Dzvimbo, Zimondi & Magijani, 2018; Mutangirwa, 2016).

It was noted that the *2013 Constitution of Zimbabwe* recognises females, and males as having a right to equal treatment and prospects in political, and social spheres (Madusise, 2018; Mangwaya, Blignaut & Pillay, 2016; Ngwenya, 2020; Republic of Zimbabwe, 2013). Hence to a certain extent this created the basis for rural female empowerment, as they are now in a position to define strategies to enable them to participate in different spheres of life. Therefore, this entails disengaging internalized oppression, and rejection of the current definition of femininity within the patriarchal society (Mukoni, 2013). However, it was noted that despite the existence of such a movement and policies to emancipate rural females from cultural oppression, it is not enough for the assurance of the progression in Advanced Level science subjects (Chabaya & Gudhlanga 2013; Chikuvadze & Matswetu, 2013; Gudyanga, Kathija, & Kurup, 2015). Therefore, the researcher' experience as science educators, together with the dearth in literature explicitly on gender issues in Advanced Level science subjects from the rural Zimbabwean female learners' perspective (Matswetu & Chikuvadze, 2014), created an impetus to engage this matter to its sensible conclusion.

2. Statement of the problem

Despite the existence of a supportive policy position (i.e. Constitution of Zimbabwe, National Gender Policy, Education Act) on rural female learners' progression in education, the number of those progressing in Advanced Level science subjects is significantly low. Therefore, the researcher sets the following question: What strategies can be put in place in order to transform rural female learners' under-representation in Advanced Level science subjects?

3. Methodological approach

In securing understandings of the participants' social experiences, and their backgrounds concerning the issue under study, researcher adopted transformative paradigm and qualitative approach (Creswell & Poth, 2018; Hay, 2016). This guided the researchers to highlight the uniqueness of situational, and circumstantial complexity of the issue under analysis (Babbie & Mouton, 2001; Denzin & Lincoln 2011; Mareva & Mareva, 2016; Tubey, Rotich & Bengat, 2015). Thus, this methodological orientation was adopted on the footing that it provided the researcher with the experience grounded in data generation platforms (Jakaza, Nyoni & Muzingili, 2018; Raditloaneng, 2013). It enabled researcher to discover how participants interacted, and why these interactions happened in the way they did in given circumstances (Henning, Van & Smit, 2004; Nieuwenhuis, 2007). Resultantly through the literature method, focus group discussion, and in-depth interviews, helped in documenting participants' experiences with the view to answer the central question (Creswell, 2013; 2009). The target population of 300 rural female learners pursuing sciences and other subjects at Advanced Level. From this target population the researcher purposively selected a sample comprised of forty-five participants

who were doing science subjects, and other subjects at Advanced Level (Chikuvadze, 2020). This, brought about an in-depth look at a small sample, which was determined by saturation (Simon & Goes, 2011). In this context, these participants were assumed to have acquired valuable experiences concerning the issue under investigation. Hence, these were seen to be in a better position to be considered credible, and dependable sources of data for the issue under investigation.

Guided by principles of integrity an ethical clearance (UFS-HSD2017/1006) was obtained from the University of the Free State's Faculty of Education ethics committee, and the permission from the Ministry of Primary, and Secondary Education (Ref: C/426/3), before data generation, and we used different strategies, inter alia member checking and an audit trail, to promote trustworthiness. Parents/guardians gave consent for their children, and who later assented to their participation in the study. In this study participants were guaranteed confidentiality through assigning pseudonyms in the form of a random number to each one of those involved in data generation (Merriam, 2009; Wright & O'Flynn, 2012). All focus group discussions, and personal interviews were conducted largely in English. The data generated were broken down into smaller, and meaningful units, which we pieced together to form less numerous categories later classified into themes guiding the discourse of the findings (Clarke & Braun, 2013; Creswell, 2013). Researcher presented, analysed, and interpreted the themes or patterns in the context of the content with the view to expose the latent meaning behind the surface of the generated data (Ahmed & Bousfiha, 2018; Minsch, et al., 2012).

4. Results and Discussion

The feminist and social learning perspectives guide the presentation, analysis, and discussion on the need to fight against rural female learners' subjugation based on cultural norms (Chauraya, 2013; Mansfield, Welton & Grogan, 2014; Marinetto, 2005; Mazur, 2016; Mikell, 2010; Moyo & Perumal, 2019; Podems, 2010). Thus, these perspective are intended to uncover how rural female learners take on as their expected patriarchal beliefs, and manners, with the view to transform their mind-sets in line with gender equality and equity prospects as enshrined the 2013 Constitution Amendment (No. 20) (Lorber, 2010; Noddings, 2002; Parson, 2016; Republic of Zimbabwe, 2013). Hence, it guided in the unpacking of the underpinning concerns, which took shape during personal interviews, and focus group discussions. Thus, learning within a rural setting is designed not only through what they do, nevertheless by who they are, and how they construe what they do (Gudyanga, Gora & Moyo, 2019).

It's, therefore, crucial to acknowledge, Zimbabwe as a patriarchal society where all roles are being appropriated to rural males with females clinging on to subservient places in the society (Chiweshe, 2016; Zinyemba, 2013). Under such circumstances, young ones are socialized to agree to sexuality variances, which differentiate rural females from the male counterparts from early stages of life (Diehl & Dzubinski, 2016; Kambarami, 2006). Hence the development of their identity either as rural

female or male is closely integrated into the learning that takes place as they play a part in innumerable societal activities. It is against this background that this section follows up, arguments corroborated through participants' views, and experiences word for word. In turn, these were set against findings from other studies.

4.1 Promoting rural female learners' progression in Advanced Level science subjects through information dissemination

This section focuses on the relevance of information dissemination to rural female learners' progression in Advanced Level science subjects. In this regard, the participants stressed the need to address the issue of information inadequacy amongst rural female learners, in a bid to raise their cognizance in decision making when selecting a combination at Advanced Level. It is against this background that one of the selected participants expressed the following:

> *We don't have a radio; it was only I paid a visit to one of my relatives in town when I heard of the STEM programme for Advanced Level learners on a local radio station. However, it was late, since I had already selected commercial subjects (Accounting, Economics & Management of Business) 'A' Level. If I had accessed this type of information soon after form 4, it was going to influence me more to opt for science subjects at form 5* (Focus Group Discussion Participant 5)

From the above discourse, it was noted that there was limited access to current information on educational prospects. In support of the earlier contribution, the following thoughts were expanded:

> *Frankly speaking, it was only when I attended the provincial quiz competition when for the first time I got to know the existence of a new constitution and how it protects us as female learners. I believe that as rural learners we need to have access to such crucial documents* (Interviewee 7)

From the narration, it can be noted that rural female learners need to be subjected to educational expeditions such that they can be afforded the opportunity to network with their peers in urban setups who have been exposed to advantageous contexts. This is supported by liberal feminists who opined that constructive transformation of rural female learners' progression in Advanced Level science subjects was a genuine need to prop up impartial thoughts amongst deprived rural female learners (Lewis, 2012). This called for the manipulation of educational policies guiding information dissemination. In support one of the participants had this to say:

> *In our rural community, it's strenuous to access current affairs on issues concerning females through newspapers or magazines, with only those with cellular phones having access to the latest information. It is against this background that I am of the feeling that in our rural school there should be unrestricted access to search for current information on various issues in the available computer laboratory. Under such a scenario we will be able to search for information on what courses are offered by a local university or any other tertiary institution [and their entry requirements]* (Interviewee 31)

Therefore, it can be noted from the discourse above that the participant regretted the reduced access to contemporary fountains of information to enable them to keep an eye on different trends in education. This, therefore, revealed that the need to expose rural female learners to adequate information will minimize the obstacles encountered in their progression in Advanced Level science subjects. This concurs with Oke and Fernandes (2020); Rwafa (2016) who noted that the availability of technologies came in handy in the dissemination of information that transforms the biased socio-cultural mind-set of marginalized rural female learners. With this in mind, the next section focuses on the influence of policy transformation on rural female learners' progression in education in general, and Advanced Level science subjects in particular.

4.2 Advancing rural female learners' progression Advanced Level science subjects through policy transformation

This section centres on gaining insights into the influence of policies on empowering rural female learners in their progression in Advanced Level science subjects. This, therefore, called for us to scrutinise these policies to set out how they tackle gender imbalances in Advanced Level science subjects. In this context, it was noted during the focus group discussions that one of the participants believed that in a social setting those in lower echelons of power find it difficult to contribute their ideas in drawing up comprehensive gender-related policies. In this regard, the following was thrown in:

> *As a young girl from this side of the province, I am of the feeling that females have been excluded from the discussion on issues to do with our welfare for long. Hence the need for us to rise and tell our own experiences about what is happening to us either at home or school* (Focus Group Discussion Participant 1)

This citation advances that most policies, and legal frameworks relating to gender equality and equity were being crafted centrally. With slim chances for the views, experiences, and voices of the marginalised groups such as rural female learners to be seized in the policy statements. This can be a result of a society that is deeply rooted in gendered belief systems. Ultimately this negatively influences rural female learners' progression in the so coined *'masculine'* Advanced Level science subjects (Chikuvadze & Matswetu, 2014). In response, there needs to implement a pervasive strategy that will not only immerse rural female learners in the policy articulation process but also that too appeals to an all-embracing conduit for their out-and-out

emancipation (Jayachandran, 2014; Marshall & Young, 2013; Mutepfa, Mpofu & Chataika, 2007). Therefore, this calls on the government as the prime policy mover to set up commissions targeting inequalities in the education system (Gudyanga, et al., 2015; Republic of Zimbabwe, Ministry of Women Affairs, Gender, and Community Development 2013).

Also, there is need for the inclusion of social justice thoughts in most spheres of the patriarchal society rather than giving attention solely to the concept of gender equality as articulated in written policies. It's in this context that rural female learners were advocating for the need to move away from 'fashionable' policy semantics into the corroborated experience through applied policies, and legal frameworks (Dube, 2015; Ford 2002; Macionis & Plummer, 2008; Shaw, 2004). In support Maunganidze (2020) advanced that through engaging rural female learners in policy drafting gives them the capability to make crucial decisions on whether to press or not to progress in Advanced Level science subjects. This sought to change the current situation where policies, and frameworks are coined in 'favour' of gender equality, however not much has been done in transmuting the existing patriarchal norms that hold back rural female learners' progression in Advanced Level science subjects.

From the above analysis, it can argued from a liberal feminist angle that policies and legal frameworks be altered with the understanding of opening up possibilities that acknowledge rural female learners as being equals to their male counterparts when it comes to the selection of Advanced Level science subjects (Khattak, 2011). As a result, the participant calls for a subjective image where rural female learners are endowed with relevant acumens to consent to a rigorous struggle against inequalities in their progression in Advanced Level science subjects. In this way a platform for rural female learners to recognize that for policy evolution to be fruitful their setting should be put into consideration (Jakaza, Nyoni & Muzhingili, 2018). In this context, a participant recounted that:

> *As for us, it is essential to be aware of what has standing acts and policies to do with the girls' interests. After that, we can call for appropriate action to be taken towards girls' progression in science subjects at form 5. This calls for support from all those around us especially our parents or guardians* (Interviewee 3)

From the above quotation it can be noted that the participant was encouraging for the conception of female responsive setting to challenge the gender ladders' continual effect on their progression in Advanced Level science subjects. This was seen as the basis for a social solidity, through bringing rural females closer to their male counterparts so as actively participate and progress in the conventional activities in general, and the Zimbabwean Advanced Level science subjects in particular (Tung-Yuang & Nai-Ying, 2009). In support Forde (2014); UNESCO (2020) postulated the need for non-polarized gender-related acts, and policies in the fight against the current procedures in Advanced Level science subjects that are inscribed around patriarchal values. This gives rise to emancipatory consciousness among the rural female learners such that they can oppose the skewed the enrolment arrangements in Advanced Level science subjects. In support of the earlier outlined sentiments a participant recognized that:

> *At the present moment, it's like these so-called gender policies are falling from the sky as we are not involved in their making. So now it's time for our voices to be heard in the decision-making process and this should start from as low as the family up to the highest level in the nation* (Focus Group Discussion Participant 11)

In support another participant had the following to say:

> *Mostly here at our school we are always told that this or that information was coming from the head office [Ministry of Primary and Secondary Education] to be followed dutifully. This brings to light the question, am still struggling to get an answer for: Whom do they consult in all this, before crucial decisions are arrived at?* (Focus Group Discussion Participant 6)

Thus, this brought to light that currently policies are being crafted by the central government and later disseminated to the periphery for implementation, with minimum input from those in the lower echelons of the society. This, therefore, portrays a picture of a microcosm that imitates underlying imbalances in a patriarchal society, which places a threshold on the participation of stakeholders with diverse experiences in policy formulation (Mangheni, Ekirikubinza-Tibatemwa & Forsythe, 2010; Van Eerdewijk & Mugadza 2015). In support Hechavarria and Ingram (2016); Mushongera (2015) highlighted society's belief to not giving much consideration to the children's contributions during 'formal' course of action, constricted rural learners' involvement in policy drafting outreach activities. This then becomes a challenge for rural female learners to be aware of the intended goals of the gender-related policies in education in general, and Advanced Level science subjects in particular (Samkange, 2015).

It was noted that the participants' responses depicted a picture that although the policymaking process was in a sense argued to be progressive, however, it was still grounded in the tenets of traditionalism and narrow-mindedness in terms of its consultation spectrum. In this context, the researcher, therefore, make a case in that the interaction set up between females, and males in this kind of power interface tends to influence negatively on rural female learners' progression in Advanced Level science subjects. This calls for society to move away from looking at rural female learners as beneficiaries of crafted acts, and policies, instead, they should be included in the policy alteration programme (Carl, 2009; Chauraya, 2013).

From this analysis, the need for emancipatory interventions that give power to disadvantaged rural female learners in families, societies, or schools was noted. This, therefore, required a radical forward movement regarding the undoing of the stereotypic thinking in the participants. In this regard, the researcher call upon all stakeholders in education to get to the root cause of gender inequalities in Advanced Level science subjects in rural secondary schools, through in-depth scrutiny of the sense of 'masculinity or 'femininity' in power interactions, which influences learners' decision making. This can be made possible by taking into consideration the significance of the empirical evidence-based policymaking process, which acknowledges individual characteristics, social, and cultural background in the formulation of gender-related educational policies (Shamase, 2017; UNESCO, 2016).

4.3 Gender-responsive approach to rural female learners' progression in Advanced Level science subjects

It can be acknowledged that though much has been done about the crafting of the gender concerns in some sections of the constitution; however, its application in the education system cannot come to fruition without the policies being embraced by the purported beneficiaries. Hence this section follows up the view set out by Chigonda-Banda (2014) on the need to transform key stakeholders' mind-set towards the coining of Advanced Level subjects either as *'masculine or feminine.'* Thus, this can be made possible by exposing rural female learners to updated information on equality to assist them to gain insight into how best they curtail the prevailing gender gap in Advanced Level science subjects. In this context, one participant recounted that:

> *If my memory serves me right I can with confidence say at this school few girls have done science subjects at 'A' Level before us. Those now pursuing science related courses at either a university or polytechnic can be invited to spend a day or just a few hours with us and those in form 4 sharing experiences* (Interviewee 25)

From the above citation it can noted that though rural female learners are experiencing gender-based discernment, they have started to explore ways that can enable them to make inroads in the male-dominated Advanced Level science subjects. Thus, from the participant's perspective, it was significant for rural female learners to share experiences with those from their vicinity who passed through the Advanced Level science subjects, and now pursuing sciences at higher levels. The researcher, therefore, denoted that this interaction amongst females from disadvantaged rural backgrounds will in one way or the other encourage those who are progressing or those who wish to progress in Advanced Level science subjects that rural females can do in these areas. In this context, it's therefore crucial for rural society to be sensitized on gender inequality concerns in Advanced Level science subjects through the conception of a critical mass of rural female learners who in turn act as protagonists in the so-called 'masculine' subjects. In support Master and Meltzoff (2017); Young, et al (2013) highlighted that, exchanging ideas with those 'similar to me,' and doing well in science-related fields can be persuasive to rural

female learners in combatting all stereotypic forms in their progression in Advanced Level science subjects.

In this context, the researcher can therefore promulgate that those who have enrolled for science courses at the tertiary level are a meaningful case in point to lift ambitions against all odds for rural female learners in the *'masculine'* subjects (Hashim & Embong, 2015; Mishkin, Wandrowics, Dori & Dori, 2016). Hence this discourse, spelt out how rural female learners' interface with role models can transform their mind-sets (Ifegbesan, 2010), which at this time tag subjects into either *'masculine or feminine'* at Advanced Level depending on their considered complexity. The researcher acknowledged that the above-proposed arrangement has the potential of bringing about a new way of socialization targeted at creating all equal opportunities in Advanced Level science subjects regardless of one's sex. However, this can only be a success if rural female learners are well equipped with relevant information on inauspicious beliefs, and thoughts at the bottom of their interactions, which are most likely to obstruct their progression in Advanced Level science subjects (Chidarikire, Muza & Beans, 2021; Dimmock, 2007). This concurred with the sentiments echoed by one of the participants during an interview:

> *In families that reside in urban areas, you can see that boys are now involved in activities like cooking and washing pots and clothes. It's my wish that one day my brothers will be seen doing the same, without being told to leave that job for me. But in my case, who will say that is the problem, as each one of us has been instructed what to do from Monday - Friday before and after school* (Interviewee 10)

The above account exposes how the participant was longing for a setting where roles and responsibilities in the rural community will not be assigned according to one's sex. This, therefore, acts as the basis for gender identity, resulting in rural males interacting more with their fathers, and on the other hand rural females spend most of their time under the guidance of their mothers. Therefore, those with whom these female learners reside within a patriarchal society can be a vehicle through which their identity can be shaped either to their disadvantage in different spheres such as education (Okkolin, Lehtomäki & Bhalalusesa, 2010; Shi & Barbrow, 2007). All this was purported to happen in a scenario where rural female learners are connected to their socio-cultural history through participation in activities, which formed their identities, and are reinforced through a revolution in gender-related activities in the society (Davies, 2003; Ezzedeen & Zikic, 2015; Maden 2015).

This concurs with Chireshe and Chireshe (2010); Olatunji (2013), in that, traditional values, which are still socially being upheld by societies are transforming slowly to influence rural females' progression in different spheres of life. This argues the need for female learners in marginal societies to be emancipated through the eradication of all forms of inequalities that have the foundation in the patriarchal structures (Boston & Cimpian, 2018). Researcher views this as a transformation from the old 'rural females-as-victims' tales to practices that counter-attack male supremacy with the aid of a series of gendered activities such as fight back any pronouncement that holds in low esteem rural female learners (Maunganidze, 2020). Therefore, this creates an environment, where *'sexism'* relating to rural female learners' progression

in Advanced Level science subjects to be seen as misplaced, and intolerable (Leaper, 2015).

5. Conclusion

This paper explored the strategies, which can be taken up with the view to negotiate operational, and cultural restrictions placed upon rural female learners' progression in Advanced Level science subjects. Hence, in this study rural female learners are not seen as submissive heirs to the methodical societal discernment. It is against this background that participants through their views, and experiences gender equality, and non-discrimination in rural learners' progression in Advanced Level science subjects can be propped up through appropriate information dissemination, policy transformation, and gender impartial approach. Therefore, this in mind calls for pervasive mind-set transformation based on an impartial social order, where prospects for one to progress in Advanced Level science subjects in rural secondary schools are not defined based on *'femininity or masculinity.'* Therefore, the inculcation of a gender-sensitive, and neutral approach, within the legal context to social processes in general, and in Advanced Level science subjects, in particular, is recommended.

Ethical Approval:

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

Consent

As per international standard or university standard, parental's written consent has been collected and preserved by the author(s).

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