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Parental Support for Rural Female Students' Progression in Advanced Level Sciences in one Province of Zimbabwe

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Abstract: In general, the patriarchal society indoctrinates rural females into accepting subservient positions in numerous domains (i.e., education). It is against this background that this study was geared towards establishing the extent to which parent support the rural female students' progression in education, with specific reference to Advanced Level sciences. Therefore, the study was driven towards comprehending what motivates and influences rural female students to progress in Advanced Level science subjects. Data analysis and interpretation were grounded in pragmatist paradigm and mixed method approach, with personal interviews and semi-structured questionnaires as instruments. The

sample for this study was comprised of 130 Advanced Level rural female students who were progressing in science subjects chosen using stratified random sampling. The quantitative data being scrutinised through the use of frequencies and percentages, and non-numerical data was analysed in accordance with the derived themes. The results acknowledged that female students in the targeted rural school encountered various gender-based challenges (i.e., labelling of science as 'masculine') in Advanced Level science teaching-learning. It was further noted that there existed limited encouragement from their parents when it comes to them venturing into Advanced Level sciences. This study concluded that from the rural female students' viewpoint their parents to a larger extent are seen as not valuing their progression in Advanced Level sciences. In this context, parents are recommended to be sensitised on the relevance of promoting rural female students' progression in Advanced Level sciences. From the results, it is advanced that work on how to transform societal views towards rural female students' progression in Advanced Level sciences.

Keywords: Advanced Level sciences, parental support, progression, rural female student

Introduction

The education curriculum is one experience that most children undergo as they are prepared for future societal functions (Olibie, 2014). Thus, its goal is to create a positive transformation in students' competencies. However, this is expected to occur in a society where the trend of rural females playing subservient roles in the patriarchal society has been seen perpetuated by certain behaviors (Uwizeyimana & Mathevula, 2014). According to Muzvidziwa (2013) social traditions can negatively influence female in coming up with a decision or participate in activities with males of their age. Thus, this environment creates an obstacle that robs females of their human identity and rights (Amin et al., 2018). In this case, females' lives, and roles they perform in society tend to be controlled by cultural barriers (Amadi et al., 2013). For example, the limited females' progression in Advanced Level sciences (i.e., Biology, Chemistry, Physics, Pure Mathematics, Statistics, and Computer Science) (Klugman et al., 2014; Mudau & Ncube, 2017). The male students who progress in these science subjects, are alleged to be born with natural capacities different from those of females (Chikuvadze, 2020). Thus, females acknowledge themselves as being lower to males and have assumed adverse opinions about their potential or capabilities (Zikhali & Perumal, 2016).

This scenario forces the underprivileged female students to the peril of being deserted in their progression in science subjects (Kane & Mertz, 2012). Hereafter, if the existing patriarchal system falls short in addressing female students' needs. These settings advance a narrative that females are at times victims to stereotypic intimidations (Tolbert, 2020). Thus, rural female students have to overcome social obstacles that question their potential to progress in Advanced Level sciences (Zikhali & Perumal, 2016). Rural females have internalised these misconceptions about their potential in education (i.e., science subjects). This is so that despite the increased attention on engaging parents to enhance their children to participation in education, inequitable representation in science pathways remains a challenge (Tolbert, 2020).

In the targeted province, several of rural female students progressing in Ordinary Level sciences (i.e., Biology, Chemistry, Computer Science, Mathematics, Physics, etc.) in rural secondary schools has significantly increased as compared to Advanced Level (Chikuvadze, 2020). Despite, the limited rural female students' progression in Advanced Level sciences, researchers (Chikuvadze, 2022; Mawere et al., 2011) interrogated this issue from other people's perspective (cultural beliefs, teachers, parents, and policymakers) from either urban or peri-urban settlements. Hence, the voices of rural female students were silent on the issue of their progression in Advanced Level sciences. It is against this background

that this study sought to interrogate rural female students' opinions concerning parental support towards their progression in Advanced Level sciences.

Research Problem

The Government of Zimbabwe introduced statutes to promote females' progression in numerous spheres of life (i.e., economy, education, politics, etc.) (Chikuvadze & Chidarikire, 2023). This intends to create an environment that empowers females in the economy, education, etc. However, the sum of rural female students progressing in Advanced Level sciences is significant. This existing gender gap in science subjects has been interrogated by various scholars (e.g., Chikuvadze & Chidarikire, 2023; Chikuvadze, 2022; van Houtte 2023) at different levels focusing on the secondary school or societal levels. Hence the need for this study to interrogate this issue from the rural female students' opinions.

Research Focus

To contribute to the empirical evidence this study intended to gain insight into this identified from the rural female students' standpoint guided by the following research objective: to establish the extent to which parents support rural females' progression in Advanced Level sciences.

Research Aim

A glance at the gender related documentation shows how various governments and non-governmental organisations are advocating for the progression of the rural females in education. Thus, rural female empowerment is increasingly gaining much attention from various stakeholders in education. Therefore, this study was aimed at understanding what motivates rural female students to progress in Advanced Level sciences, source of influence for their progression in Advanced Level science subjects, and issues discouraging them from progressing in Advanced Level sciences.

Theoretical framework

The interrogation of rural female students' opinions towards parental support in their progression in Advanced Level sciences was guided by a theoretical lens made up of functionalism, socialism, and feminism theories. This lens distilled the selected respondents' insights about gender issues in science education and to consider some challenges encountered by rural female students in their progression in Advanced Level sciences. Thus, the framework articulates an intersection between these theories, and rural secondary school contexts in a bid to shed light on rural female students' underrepresentation in Advanced Level science subjects. These theories are taken to be appropriate for this study because when the potentials of rural female students are harnessed through equality and equity (Unterhalter, 2023). Through this framework, this discussion is expected to interrogate various hidden forms of oppression of rural female students in their progression in Advanced Level sciences. This was done through listening to rural female students' understandings and compensable consideration to societal values and practices (Lappalainen et al., 2023).

According to feminists, historically males had more power than females in the patriarchal society (Sen, 2023). Thus, the gender conflict has been seen as the foundation of the society. It is in this context that feminists advocate for the empowerment of the historically disadvantaged rural female students in their progression in Advanced Level science subjects (Shukla & Mishra, 2020). This creates a scenario where rural female students to acquire relevant knowledge, skills and attitudes in different spheres of life (Griffiths & Millei, 2013). In this case education needs to create an environment that brings out the best out of both the females and males (Kalita, 2017). According to Newchurch (2017) functionalists consider education as a crucial social tool that can be used to maintain stability in society through the creation of the sense of empowerment through instilling values and roles. Thus, education is considered

as one of the ways that can be used to break through the cultural conservatism. The next section interrogates relevant sources that cover issues related to parental support and its impact on rural female students' progression in education.

Mahuro and Hungi (2016) considers the family as the fundamental unit in nurturing a child. Hence, the parental support is necessary as an individual traverses through different stages of growth (i.e., from infancy to adolescence). In this context, parental support refers to all forms of nurturing that are given to school-age child (i.e., either a female or male) by parents, and guardians in order to ensure the accomplishment of societal expectations (Waters et al., 2014). In support, Gonzalez-Mena (2011) postulated that parental support was a blend of obligation and dynamic involvement on the part of the parents to the child's progression in sciences. This takes diverse forms at home, for example the provision of basic necessities, instilling expected social values, moulding of positive behaviour, and, enhancing educational aspirations (Rafiq et al., 2013).

According to Anyikwa and Obidike (2012), the parental support is expected to influence how the child makes decisions in life (i.e., career choices). Thus, this is expected to create a platform that promotes effective learning both at home and school. In these circumstances parents are seen as active collaborators in their child's growth and development. Therefore, parents should be well informed about the secondary school operates and their child's progress in learning activities (Olibie, 2014). In this regard parents should be part of their child's educational success through the provision of psychological and academic needs, school-to-home communications, etc. (Lawrence & Fakaude, 2021). However, the parental support during the child's growth and development varies within societies and cultures (Amin et al., 2018). It is in this context that this discussion formed the lens through which the issue under investigation were interrogated with the view to add on empirical evidence on going discourse around rural female students' progression in Advanced Level sciences.

Research Methodology

General Background

This study was grounded in a pragmatist paradigm and mixed-method approach in data collection, analysis, and interpretation (Gobo, 2023). This methodological design was an expedient, and compatibilist lens for selecting the research design that cut across the quantitative and qualitative gulfs (Foster, 2023). Hence, it assisted the researchers to collect, analyse and interpret the current issue with the purpose of engaging the data to articulate the issue under investigation (Luu et al., 2023).

Sample/Participants

From the purposively 10 selected secondary schools in one province, one thousand rural female students studying Advanced Level sciences as potential respondents were identified. A stratified random sampling was used to selected respondents (Ansary et al., 2023), from the 1 300 Advanced Level students according to their rural secondary schools. The potential respondents were put into stratum according to their schools. The random selection was conducted in each of the strata to come up with a representative sample comprising 130 Advanced Level rural female students.

Instrument and Procedures

The study was conducted in phases among them literature method used to identify the gaps to be filled by this study; personal interviews; and a semi-structured questionnaire with open and close-ended indicators focusing on source of motivation to progress in Advanced Level sciences, sources of influence in rural female students' selection of Advanced Level sciences, and issues discouraging rural female students from progressing in Advanced Level sciences was applied to the selected 130

respondents. The objective of this semi-structured questionnaire was to collect data in dependable and effective manner (Taherdoost, 2016). Thus, the precision and constancy formed a significant aspect of the data collection process. The semi-structured questionnaire had a measurement scale that included the following: strongly agree, agree, strongly disagree, and agree. In order for the researchers to triangulate data collected through the earlier on mentioned instruments, personal interviews were conducted. 20 respondents for interviews were purposively selected, the inclusion criterion was that they should have been involved in the completion of semi-structured questionnaire. Both numerical and non-numerical data solicited through these instruments were in the context of the issue under investigation.

Data Analysis

The numerical and non-numerical data were analysed through descriptive statistics and thematic analysis respectively. Ethical considerations were at the centre of data collection, analysis, and discussion. Respondents' contributions are presented in the following sections below.

Research Results

The respondents were asked to share experiences concerning parental support on rural female students' progression in Advance Level sciences. Apart from the fact that the selected respondents were adolescents under the guidance of their parents, there was a probability that their interests and intellectual acumen may prompt their progression in Advanced Level sciences, among other issues. Their motivation to progress in Advanced Level science subjects is discussed below.

Rural female students' motivation to progress in Advanced Level sciences

This section interrogates respondents' views on what motivates rural female students to progress in Advanced Level sciences.

Table 1

The Analysis of the Source of Motivation to Progress in Advanced Level Sciences (Based on the Closed Questionnaire)

Indicator(s)	Strongly Agree	Agree	Strongly Disagree	Disagree
Encouragement from parents	2.3	5	67.7	25
Other females studying engineering in tertiary institutions	50	31	11.5	7.5
Pressure from peers	35.5	53	7.7	3.8

From the table above it can be noted that a few respondents (2.3%) strongly agree and (5%) agree with the notion that encouragement from parents was a source of motivation for rural female students to progress in Advanced Level sciences. On the other hand, most of the respondents (67.7%) strongly disagree with the opinion that encouragement from parents was a source of motivation for their progression in Advanced Level sciences. However, most respondents (50%) strongly acknowledged that other females progressing in engineering in tertiary institutions were a source of motivation for them to progress in Advanced Level sciences. In this regard, one of the respondents noted that:

Upon expressing my wish to pursue pure mathematics or statistics at Advanced Level my parents (dad) became uncompromising. He questioned where as a woman would I apply the mathematical principles in the local community to earn a decent living. I was instructed to go for commercials, such that I can venture into projects like gardening and later sale the products (Respondent 1)

In support, another respondent highlighted that:

At home, my siblings [females] are pursuing either arts or commercials in local polytechnics and universities. Hence, we spend most of our spare time chatting about careers in these fields. On rare occasions we talk about sciences they will be talking about the challenges associated with females' progression in these areas (Respondent 15)

From the above presentation it can be revealed that though the respondents had different sources of motivation when it comes to progression in Advanced Level sciences, the respondents acknowledged that their parents were the least source of motivation. This situation is heightened by patriarchal norms, which give priority to most social issues to males, with females playing subservient roles. The next section on sources of influence for rural female students' career selection is presented and analysed.

Table 2

The Analysis of Sources of Influence in Rural Female Students' Selection of Advanced Level Sciences (Based on the Closed Questionnaire)

Indicator(s)	Strongly Agree	Agree	Strongly Disagree	Disagree
Parents	11.5	19.2	62.4	6.9
Teachers	53.8	30.8	11.5	3.9
Friends	57.7	26.9	9.2	6.2

From the statistics presented in Table 2, it's interesting to note that (11.5%) of the respondents strongly agree with the notion that parents were a source of influence in rural female students' selection of sciences. In addition, (19.2%) of the respondents agreed that parents were a source of influence in rural female students' selection of sciences. From another angle, it was noted that most of the respondents (62.4%) strongly disagreed with the notion that parents were a source of influence in rural female students' selection of sciences. In other words, rural female students' progression in Advanced Level sciences tends to hit a brick due to parents' limited influence in their selection of science-related career paths. As a result, rural female students select careers or subjects that satisfy their parents' demands and expectations. It was also, revealed that teachers and friends were some of the key sources of influence in the rural female students' selection of Advanced Level sciences. In this context, a respondent acknowledged that:

When fetching firewood with other young women during the school holidays programmes that one can do after completing Advanced Level. Some of these girls are pursuing different programmes in polytechnics and universities, majoring in commercials and social sciences (Respondent 13)

Thus, another respondent revealed that:

On fewer occasions I interact with girls pursuing science-related programmes either in polytechnics or universities, they share with us their nasty experiences. In some instances, they highlight that they are taken as being outsiders in the so-called 'masculine' programmes (Respondent 1)

Further to this one of the respondents noted that:

Yes, I am pursuing science subjects at Advanced Level, though with limited encouragement from my parents. Our discussions most of the time centred on issues, which have nothing to do with career selection or what I intend to do after Advanced Level.

However, my Advanced Level Pure Mathematics encourages me to do well in my studies such that I can pursue the so-called 'masculine' programmes at university (Respondent 20)

These results brought to light the point that some parents discourage rural female students from progressing in Advanced level sciences. Thus, traditionally prearranged gender roles have a great influence on rural female students' science-related career path interests (Omar, 2011). However, the female students' interests, and abilities are not taken into account when some of the decisions are made. In the next section issues discouraging rural female students from progressing in Advanced Level sciences.

Table 3

The Analysis of Issues Discouraging Rural Female Students from Progressing in Advanced Level Sciences (Based on the Closed Questionnaire)

Indicator(s)	Strongly Agree	Agree	Strongly Disagree	Disagree
Rural parents inspire their sons to get married women who participated in sciences at Advanced Level and beyond	8.5	10	46.9	34.6
Rural parents were of the opinion that women with science-related professions do not respect husbands with non-science-related professions	43.8	31.5	11.5	13.2
Rural parents discourage women from taking up science-related professions	42.3	32.3	19.2	6.2
Advanced Level sciences are coined 'masculine' subjects	66.9	20.8	4.6	7.7

The above results revealed that most of the respondents (46.9%) strongly disagree with the opinion that rural parents inspire their sons to get married women who participated in sciences at Advanced Level and beyond. In addition, some respondents (43.8%), strongly agree with the view that rural parents were of the opinion that women with science-related professions do not respect husbands with non-science-related professions. From another angle, some respondents (42.3%) and (32.3%) strongly agree and agree respectively to the notion that rural parents discourage females from taking up sciences at Advanced Level. In the same vein, most of the respondents (66.9%) strongly agree with the opinion that science subjects are coined 'masculine.' In this context, rural female students might become reluctant to progress in Advanced Level sciences and beyond. This tends to leave them in a tight corner when it comes to whether to progress or not to progress in Advanced Level sciences. Those who opt to progress in Advanced Level sciences might considered as outcasts in the patriarchal rural society. In this context, one of the respondents noted that:

During discussions with my parents, I am always reminded of a certain village woman who is in her late 30s but still single. A lot of stories a being peddled about why she is unmarried, one of which is that males are afraid to approach her due to her professional qualifications (Respondent 15)

The above results concur with Amadi et al. (2013) who highlighted parents' fear of cultural belief

systems instills odd defiance, and ideals, which makes parents believe that rural female students upon progressing in sciences will become non-compliant to cultural expectations. In this case, cultural expectations favor rural male students to progress in Advanced Level sciences as opposed to rural female students. This is a clear indication that sex-role type of subject selection and gender difference in the patriarchal culture has some objectionable influence on rural female students' progression in Advanced Level sciences. This was supported by a respondent who postulated that:

At our school female students pursuing Advanced Level science subjects on most occasions are seen moving around with boys. They don't interact with fellow female students pursuing other subjects at Advanced Level. Thus, they are seeing themselves as if they are 'boys' (Respondent 11)

This brings to light the point that sciences were stereotyped, thereby making it difficult for rural female students to progress in these subjects at Advanced Level. From another angle, one of the respondents revealed that:

Just before sitting for my [Advanced Level] examinations, mom promised to mobilise resources such that I can attend some [science subjects] extra lessons. This was a welcome move since I wanted to pass with flying colours. At the bottom of my mind, I having a thought that I should be the first engineer in our family (Respondent 4)

This is an unquestionable circumstance that in the absence of constructive backing, any determination to advance rural female students' progression in Advanced Level sciences was greatly hampered (Ajaja, 2012). Thus, if parents value their children's education irrespective of their sex, they tend to inspire them to select the career path of their choice (Dube, 2020). However, another respondent from a different viewpoint highlighted that:

At our school in the [Advanced Level] Physics group, am the only female student. However, the going is not all that rosy. I am finding the going a bit tough since A[dvanced] Level Physics involves a lot of challenging calculations. Provided with another chance I would opt for the arts combination and join other rural female students (Respondent 12)

In this context, Advanced Level sciences (Biology, Chemistry, Computer Science, Mathematics and Physics) were seen as having a 'masculine' image. Thus, this inclines towards sex stereotyping, and relates negatively to rural female students' progression in Advanced Level sciences. Under such a scenario rural female students tend to develop beliefs that they cannot progress in Advanced Level sciences, which are perceived as being inappropriate to their gender. The above contribution concurs with Mapfumo et al. (2002) who postulated that from patriarchal standpoint males are thought to be born with talents different from those of rural female students. This gives credence to the notion that rural female students do not progress in Advanced Level sciences due to their parents' attitudes towards them. In support one of the respondents highlighted that:

Parents were stopping rural female students from progressing in science-related professions. For instance, one Form Four female student was dispirited from progressing in science subjects, though she was brilliant in these subjects. [...] not much was expected from us as rural girls (Respondent 9)

The results showed that social beliefs excluded rural female students from progressing in scientific and technological developmental processes. Thus, rural female students were expected to have their major roles around the home, marriage and motherhood. This was seen as having a negative effect on rural female students' progression in Advanced Level sciences. Thus, rural female students nurtured to admit the gender prejudice, which if not reversed, in the long term will continue to create a situation in which rural female students are underprivileged in science-related careers or professions. Thus, parents

are persuasive in the gender inclined societal activities; this buttress gender-stereotypical expectations in rural female students' progression in Advanced Level sciences.

Discussion

In this paper, respondents were questioned in terms of the opinions on parents support towards rural female students' progression in Advanced Level sciences by conducting interviews, and applying semi-structured questionnaires. It was found that though the government proclaimed policy guidelines to advance the progression of students in education, there is still a huge gap in rural female students' representation in Advanced Level sciences. Thus, this has created the platform for the authors to look at how other factors (i.e., parental support, etc.) influence rural female students' progression in Advanced Level sciences (Mead, 2023; Mowen, 2015). From this study, it can be noted that from the respondents' viewpoint parents' motivation or influence on rural female students' progression in Advanced Level sciences was limited. In addition, parents were seen as discouraging rural female students' progression in Advanced Level sciences. Thus, patriarchal prospects around roles and activities that are assigned according to gender tend to influence parents' opinions towards rural female students' progression in Advanced Level sciences (Cho, 2015; Guillaume et al., 2014).

The results showed that though rural female students were ambitious to progress in Advanced Level sciences, they are finding it problematic to break glass ceiling due to limited influence from their parents. This concurs with Kwaw et al. (2022) who postulated that in rural areas, there is a viewpoint that female students were a liability, and are only meant to carry out household chores. This discourages parents who grew up in a patriarchal society to support rural female students' progression in Advanced Level sciences. In other words, cultural gender expectations tend to stress, other ambitions for rural female students (i.e., motherhood or marriage) over progression in Advanced Level science subjects (Okeke, 2004). The opinion that in a patriarchal society by means of rigid domestic relations female students cannot match the demands of the Advanced Level sciences (Kiamba, 2008; Moyo & Perumal, 2020). Therefore, this creates an environment that discourages rural female students from progressing in Advanced Level sciences. This has an unfavourable effect upon rural female students' mindset, as they usually ridiculed and laughed at.

In other words, rural female students' limited progression in Advanced Level sciences raises tough questions within education sector concerning their continued marginalization the so coined 'masculine' subjects (Chikuvadze, 2020). This concurs with Lips (2013) and Tharenou (2013) who postulated that rural females were likely to come across gender inequality in their schools. Thus, rural female students' involvement in some arrangement that portrays gender inequality through their interactions with parents, regardless of potential to progress in Advanced Level sciences. This is grounded in the patriarchal ideas, customs, and norms that contribute to the 'masculinization' of Advanced Level sciences (Ntekane, 2018; Wilder, 2014). Thus, patriarchal structures can subsidise to the decrease in the sum of rural female students progressing in Advanced Level sciences (Herrero et al., 2017; Joensen & Nielsen, 2013).

It's against this backdrop that academic gender studies (Cech & Blair-Loy, 2019; Sang, 2018), are portraying diverse viewpoints, which incorporate gender balance in terms of the students (both females and males), irrespective of their difference in societal roles. This might also result in a remarkable upsurge in the figure of those rural female students progressing in science, technology, engineering, and mathematics (Hyde & Mertz, 2009). Thus, cultural beliefs like the diverse roles females and males participate in society and in conclusion, customs, which make available prospects for both sexes (Abusalha, 2023). In addition, parents tend to masculinize Advanced Level sciences learning environment by portraying rural female students as not being fit to progress in it (David, 2016; Legewie

& DiPrete, 2012). Rural female students under such limited motivation and inspiration from their parents find themselves in a situation where they are restricted to progress in Advanced Level sciences. Hence, the gender-role culture prevailing in the society, might impact rural female students' progression in Advanced Level sciences (van Houtte, 2023). Consequently, these respondents concur with Kirmak (2017); Mahuro and Hungi (2016) who postulated that rural female students need to interact with others (parents, siblings) such that they can raise the social awareness on the need for their progression in Advanced Level sciences.

Conclusions and Implications

The results exposed that rural female students encountered various gender-based obstacles when progressing in Advanced Level sciences, such as coining these subjects as 'masculine' and stereotype-related to the capabilities of females. It was further revealed that there was limited praise from parents as rural female students to undertake Advanced Level sciences. Thus, respondents advanced the opinion that rural female students' progression in Advanced Level sciences was chiefly influenced by traditional beliefs. These beliefs tended to place rural female students in subservient spot in their progression in Advanced Level sciences. These gendered opinions tend to regulate rural female students' progression in Advanced Level sciences. Thus, the respondents viewed parents as not being supportive of the underprivileged rural female students' progression in Advanced Level sciences. In other words, the lack of parental support was a major flaw in rural female students' progression in Advanced Level sciences. Hence, need to re-socialize parents in rural communities into a new direction where gender equality and equity are the custom. Therefore, this inadequate parental support at grassroots level discourages rural female students from progressing in Advanced Level sciences. Hence, the need to invite parental support in rural female students' progression in Advanced Level sciences learning activities. This creates the platform for the parents to transform their mindsets such that they can meet the interests of the underprivileged rural female students. In addition, there is need to sensitise parents on the importance of rural female students' progression in Advanced Level sciences and the provision of adequate moral support is recommended. In addition, we recommended that community build effective partnerships with rural secondary schools to continually develop, implement, evaluate, and improve rural secondary school-based parental involvement plans. Thus, these plans should support practices, which push for the school, family and community to be involved in rural female students' progression in Advanced Level sciences in diversified ways.

Suggestions for Future Research

Future research is expected to focus on a detailed qualitative analysis of rural female students' understandings of barriers to their progression in Advanced Level sciences. This provides an in-depth understanding of their experiences with the view to contribute towards the creation of an inclusive environment for their progression in Advanced Level sciences. A comparable inquiry indulging the same methods including parents, policymakers and teachers should be carried out with the view to provide an all round comprehension of parents' support in rural female students' progression in Advanced Level sciences. In addition, a mixed-methods approach can be used in advancing an in-depth conception of parental support in rural female students' progression in Advanced Level sciences.

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