

Gender Responsive Pedagogy Practices: Secondary School Science Teachers in Ethiopia

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Abstract

This paper examines the current status of secondary school science teachers' gender-responsive pedagogy (GRP) practices. Women's participation in secondary school teaching is a major concern in many regions of the world. The use of instructional strategies that promote gender inclusion and sensitivity in initial teacher training is very important in the development of teachers. In this paper, the use of gender-responsive pedagogy in Ethiopia's secondary school program is highlighted. Using data from baseline, midterm, and end-line surveys, the paper addresses how tutors and mentors use gender-responsive pedagogy and the changes that have occurred as a result. The study adopted a qualitative approach using lesson observations and interviews to capture data from ten novice teachers and twenty mentors sampled from six secondary schools. The findings presented in this paper reveal that there has been significant improvement in the use of gender-responsive pedagogy by tutors within the core subjects (English, Mathematics, and Science). Both male and female tutors demonstrated increasing use of gender-responsive pedagogy in their teaching. A similar increase has been found in the use of gender-responsive mentoring strategies by mentors. The paper concludes by highlighting the implications of the findings for policy in the use of gender-sensitive pedagogy in Ethiopia's secondary school program. It also assesses the GRP practicing status of the teachers according to their gender and level of teaching experience. The required data were gathered from teachers, department heads, school principals, and students via interview and focus group discussion (FGD). The qualitative data were organized thematically by taking into account the issues raised in the research questions. By so doing, the findings revealed that science teachers were competent in their classroom organization and interaction and in tackling sexual harassment. On the contrary, they were ineffective in creating gender-sensitive lesson plans and teaching materials, and they also were weak in treating the subject of sexual maturation. The study also found that the teacher's gender and their level of teaching experience did not affect their GRP practices.

Keywords: Gender, Science Teaching, Gender-Responsive Pedagogy, Qualitative research, Ethiopian Education

Introduction

According to E.D. Ananga (2021), there is a significant body of evidence demonstrating that addressing inequalities in girls' education is an effective strategy for breaking the cycle of intergenerational poverty and for lifting girls and their families out of positions of marginalization. In Ethiopia, the importance of improving girls' access, retention, and transition through the education system from kindergarten through to tertiary education is widely acknowledged (Ananga, 2021). As such, there has been a growing interest in and efforts at addressing gender-related barriers in the education system. One major setback related to girls' access to education involves issues around girls' school enrollment (age of entry), retention, and completion (Moeller, 2018). In some communities and homes, girls tend to be engaged in extra house chores which sometimes limit the time available for them to do education-related tasks. In

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addition, within schools, it is sometimes the case that the culture, including materials and pedagogy used, tends to reinforce unequal treatment of girls and boys. Several interventions have therefore been implemented to address gender biases, especially in access to education (Swanson & Holton, 2005). It is critical, however, that the challenges to girls' access, retention, and completion be addressed simultaneously. The teacher has been identified as a critical factor in sustaining grade completion among girls. It has been argued that teachers' adoption of gender-responsive pedagogy is one way to ensure grade survival and completion for both boys and girls (Ananga, 2021). School is particularly expected to be a space that creates an enabling learning environment for all students. The use of gender-sensitive pedagogy is therefore critical if the dominant gender bias within a patriarchal system is to be challenged.

Literature Review

Ethiopia has engaged in many initiatives to scale up its economic development and gender equality by focusing on education in general, and science and technology in particular (Tilahun, 2013). To start with, the national science and technology policy of the country was first issued in 1993 to ensure a reasonable standard of living by accelerating the pace of economic development. A revised national science, technology, and innovation policy was adopted in 2012 to enrich the capabilities that enable rapid learning, adaptation, and utilization of effective foreign technologies (Mamo, Mekuriaw & Woldehanna, 2014). Classroom set-up was found to create dynamics that affected teaching and learning processes. Some of these included content delivery, large classes, teacher-learner interaction, learner-learner interaction, teacher and learner interaction presentations, and teachers' and learners' behavior and morale. Further, Tilahun (2013) found that teachers grouped pupils according to abilities. Boys, who were thought to be better performers, were grouped together while girls were put in their own groups. Girls were found to be shy and lacked confidence and belief in their capabilities, which had a negative impact on their learning. Further, institutions did not have adequate or appropriate infrastructure and furniture. This was particularly serious in the schools that did not have adequate and appropriate sanitation, such as water, sanitary bins, sanitary pads, or adequate toilets for girls. It emerged that in most schools there were few, dirty toilets that did not cater to girls' menstruation needs. Some of the toilets did not have doors and therefore did not provide privacy. As a result, most girls stayed away from schools during their menstrual periods, which led to poor performance and dropping out of school (Carrel, Pogy & West, 2009). In most regions, girls also dropped out of school due to early pregnancy and early marriages, which were found to be prevalent. Further, parents did not give adequate attention or support to girls' education. Families often used children, especially girls, to generate income through trade, employment, or other labor. Girls were assigned to perform household chores and acted as house-mothers when their mothers went to the markets to buy and sell goods.

Pedagogy as a concept embraces virtually all teaching and learning processes within the context of the classroom. Pedagogy is a term that includes what is taught (the content) and how teaching takes place (the teaching process). Gender-responsive pedagogy refers to teaching and learning processes that pay attention to the specific learning needs of female students.

In Ethiopia and other developing countries, revising and modernizing the school curriculum has been conducted with an academic focus on mathematics and science in response to economic needs, and these efforts are supported through the development and dissemination of quality learning materials. To improve science and mathematics instruction, the nation's education system focused on developing school curricula and a large number of teachers were also trained by the ministry of education. Teaching and learning materials are fundamental to the pedagogical process and are critical for shaping young minds. Yet an examination of textbooks and other learning materials reveals that they implicitly communicate traditional and limited gender roles such as a low participation of women in school leadership. Scholars in the learning sciences have emphasized that developing these kinds of skills requires a different kind of

teaching and learning materials than in prior eras of education when learning was conceptualized as the acquisition of facts and teaching as the transmission of information (Subrahmanian, 2008).

Gender equality and economic growth may not be attainable without the instructional involvement of girls, because educating them is critical to long-term gender equality and social change (Mlama et al., 2005). Gender equality in access to health and education occupies a central place in the global policy discourse on human and social development (Subrahmanian, 2008). Giving girls equal admission to education is not only their right, but it is also important in a practical sense to achieve significant social and economic benefits for the country. Consequently, the Ethiopian government has been working to achieve gender equality in various sectors by introducing various initiatives, policy directions, and institutionalizing ministerial offices (Olkaba, 2013).

Gender issues have received high priority in the education policy of Ethiopia since the new government came to power in the early 1990s. The nation also adopted the GRP model from the Forum for African Women Educationalists (FAWE) as a national policy in 2014 and has practiced it since then. Despite such attempts, gender disparity in enrollment as well as academic achievement is the main barrier that has influenced the teaching-learning initiatives of the nation (UNICEF, 2018; Dimbisso, 2009). To address the challenges of gender inequality, the government of Ethiopia views gender-responsive pedagogy as a crucial strategy (Beyessa, 2015).

GRP is the teaching and learning process that pays attention to the specific learning needs of girls and boys. It calls for teachers to take an all-encompassing, gender-sensitive approach in the processes of lesson plan preparation, classroom management, and evaluation of students' academic performance. It also assists teachers to scale up their capacity for addressing gender (Mlama, 2005). The guidebook equips teachers with knowledge, skills, and extends their attitudes towards GRP practices; it enables them to develop and use gender-responsive methodologies to ensure equal participation of girls and boys in the teaching and learning processes. The manual emphasizes how to create a gender-responsive academic environment, indicating various ways to transform learning and teaching processes by taking the context of gender into consideration (Ababa, 2012).

Researchers have also examined teachers' gender and their teaching experience as factors that affect gender equality, but their findings have been quite different and even contrary to each other. On the contrary, Nnamani & Oyibe (2016) revealed that girls and boys who were taught by male teachers obtained higher mean scores than those taught by female teachers. Regarding teachers' teaching experience, Cherubini (2008) found that novice teachers demonstrate fluctuating levels of support, dependency, and autonomy in their initial year of practice. Schools that have more teachers with above 10 years of teaching experience achieved better results than schools with more teachers with 10 years or fewer of experience (Ewetan & Ewetan, 2015). However, Zhang (2008) argued to the contrary that teaching experience does not affect students' learning.

Generally, research findings show that gender inequality is a major challenge that affects the instructional process of the nation (Igberadja, 2016), and the present study aims to address that problem further.

Statement of the Problem

Although governmental and non-governmental organizations have played their roles by organizing local and global conferences for gender equality and to improve the involvement of girls in education, gender disparities still exist in the general secondary schools' instructional activities (UN Women, 2014). Unequal involvement of male and female individuals in the teaching and learning processes is one of the key problems that educational organizations are facing these days (Botella et al., 2019). Out of 83 developing countries' data, for example, half achieved gender equality at the primary level, and less than one fifth at the secondary level (UN

Women, 2014). Some teachers in general secondary schools also saw science as a male subject, and their support of female students was weak. As a result, girls accounted for 27% of students enrolled in science studies in 2013 (Beyene, 2015).

Ethiopia has shown a desire to improve male and female students' instructional participation, but the nation's efforts to improve girls' education can still be considered weak (Dimbisso, 2009; UNICEF, 2018). There is not only low enrollment for girls but also higher rates of dropping out and repeating grades for females than for male counterparts in the country (Dimbisso, 2009). Furthermore, the ratio of total male to total female students in the years 2007 to 2011 was 4 to 1. Girls were weaker than boys in their classroom participation, and boys often overlooked the academic performance of girls (Jones et al., 2014.)

Nonetheless, Ethiopia has made remarkable signs of progress in its girls' education as the net primary enrollment rates have increased from 51% in 2003/04 to 95% in 2016/17. However, only 53% complete primary school, 25% of secondary school-aged girls attend secondary school, and an estimated 10% of women are enrolled in college (UNICEF, 2018). Similarly, gender inequality was clearly seen in the instructional process of this study's research setting, where the instructional environment was biased against girls. Girls are forced to engage in excessive domestic work at home and in other income-generating activities to support their family members (Ananga, 2021). Girls' learning involvement is influenced by parents, who place demand on the girls' labor and time. Predominantly, female students in the country are forced to complete more home and farm-based tasks than boys (Ananga, 2021).

Female students' migration towards Arab countries also influenced girls' learning in Ethiopia (Karippai & Belay, 2010). Raya Kobo is one of the districts of North Wollo Zone in which a significant dropout rate was observed due to students' migration; the rate of girls' absenteeism increased by 3% since 2012.

To tackle these challenges, Ethiopia has adopted the GRP guide in 2014 and implemented it thereafter (Moges, 2021). However, there is no existing research that examines to what extent the themes of GRP have been exercised in the nation's education system, and the effects of such pedagogy upon gender inequality (UNICEF, 2018). Therefore, this research aimed to examine teachers' GRP practicing status, in correlation with their gender and teaching experience. The GRP has seven themes: lesson planning, language use, preparation and usages of instructional materials, classroom setup, classroom interaction, management of sexual harassment, and addressing sexual harassment (Mlama, et al., 2005). The themes of the GRP helped classroom teachers to facilitate their teaching by bearing in mind the gendered experiences of students (Zengel & Alemayehu, 2016).

Objectives of the Study

To achieve the intended objectives of the study, the following research questions were formulated:

- What are science teachers' most and least practiced themes of GRP in their teaching?
- Are there differences among science teachers in practicing GRP, correlated to their gender (male or female) and teaching experience (high, medium, and low)?

Significance of the Study

The authors of this study supposed that the findings of this research might help science teachers to treat male and female students equally in their instructional activities; it could give opportunities for them to revise their actual teaching roles in regard to GRP themes. It might also initiate district education offices, zonal education departments, regional education bureaus, and other stakeholders to make secondary school teachers more aware of GRP by designing training, symposiums, workshops, and panels.

Operational Definitions

Gender-responsive pedagogy is a teaching and learning process that motivates teachers to pay attention to the interests of girls and boys in their practicing of GRP themes.

Secondary school science refers to science subjects (physics, chemistry, and biology) taught by science teachers at grade levels nine and ten within the Ethiopian context.

Science teaching is an instructional activity that is conducted in the GSS, with context-specific attention to gender issues. Courses such as biology, chemistry, and physics are the main emphasis.

Teaching experience implies the involvement of teachers in teaching activities over a period of time that leads to an increase in knowledge or skill.

Method

A qualitative approach was employed in this study for the following two major reasons. Firstly, since the study was conducted to assess science teachers' GRP practicing status, the qualitative part of the study surveyed the role that GRP played in eight general secondary schools (Kothari, 2004).

Thus, the researchers concurrently conducted the quantitative and qualitative elements in the same phase of the research process by taking into account both methods equally to analyze and interpret the results (Field, 2013). Then, the authors discussed the statistical results followed by qualitative interview data that supported or put into question the quantitative findings (Creswell, 2017). The researcher used a quantitative, cross-sectional survey to collect information from respondents at a single point in time (Teka, 2009). In the qualitative part, a case study was used in which the researchers investigated GRP practices of science teachers by gathering data through detailed interview and focus group discussions (Ochieng, 2014). These data gathering tools were validated and checked for their meaningfulness and consistency. The qualitative data were analyzed by coding, categorizing, and interpreting thematically.

Participants

According to the academic data of 2020, there were 200 science teachers, 45 science department heads, 4000 students, and 33 secondary school principals in the 33 secondary schools of the North district. These figures were taken as the population of the study. Of the fourteen districts of the zone, Gubalafto, Kobo, Habru, and Woldia were selected purposively because girls' learning status is challenged because parents' gender role expectations, migration, and girls' experience of sexual harassment are more prevalent in the selected districts of the zone (Karippai & Belay, 2010; 2018). Grades nine and ten science teachers, science department heads, school principals, and students of the four districts were respondents in the study.

Of the 33 secondary schools found in the four districts, 8 of them (Mersa, Srinka, Sanka, Hara, Woldia, Woldia Millennium, Kobo, and Euketchora) were selected through quota and simple random sampling (lottery method) by taking two schools from each of the four districts. Sixteen students (M=8; F=8) shared their ideas, feelings, and experiences regarding their teachers' GRP. In selecting students, the researchers consulted with general secondary school (GSS) science teachers to find willing and informed student participants. As teachers are the main practitioners of the GRP in their respective classes, they were used as the major data sources.

Data Collection Instruments

To collect data, interviews and focus group discussions (FGD) were both used.

Interviews were used as a data collection instrument for the current study because they enabled the researchers to get detailed information. Interviews permitted them to explore issues which might be too complex to investigate through questionnaires and allowed for better

flexibility for interviewer and interviewee. Interviews gave the respondents a better opportunity to explain what they felt on the issue more explicitly.

Focus Group Discussions (FGD) are vital as a data collection mechanism because participants have the opportunity to share their points of view related to science teachers' GRP practices. Through FGD, the researchers collected information from science department heads and school principals via semi-structured questions that were designed based on the review of related literature and leading research questions.

Results

Department heads and school principals in their FGD seemed to agree on what student participants remarked above. Principals, department heads, and students agree that male and female science teachers treated students equally, without gender discrimination. Interview and FGD were conducted and findings from both methods revealed that the teachers' gender did not affect their GRP practices.

Generally, the study revealed that science teachers were successful in considering both their male and female students' perspectives and interests regarding the four GRP themes (language use, classroom interaction, classroom setup, and sexual harassment). Teachers' choice of words and sentences reflected students' gender in the three other themes of the pedagogy: management of sexual maturation, lesson planning, and preparation and use of instructional materials.

Science Teachers' GRP Practices in Relation to their Teaching Experience

To identify science teachers' GRP implementation status in relation to their teaching experience, the collected data were analyzed. Researchers asked students, science department heads, and school principals the question, "How do science teachers consider boys and girls in their teaching based on their teaching experiences?" All the FGD and interview respondents shared what one FGD respondent explained: Although teachers with years of teaching experience may be expected to have more content knowledge or experience, they may commit less to share their experience since they may be exhausted by serving for long periods. In contrast, teachers with fewer years of teaching experience may be expected to be energetic and to take initiative to share their experience with students, but they may lack skill to facilitate their teaching. However, these assumptions have not been observed in science teachers' actual teaching. Regardless of their years of teaching experience, teachers in our study have played their roles effectively to achieve a gender-responsive-classroom environment. To sum up, the qualitative data indicated that science teachers of all levels of teaching experiences facilitated the GRP without a significant difference.

Major Findings

- Teachers have become more gender-aware and have adopted practices that promote equal participation of boys and girls within the school environment, so that girls are not belittled or made to feel uncomfortable.
- Teaching methods and learning materials take into account the specific learning needs of female and male students. They consider the context of gender in terms of what is taught, how teaching takes place, and how what is taught is learned by male and female students.
- In Ethiopia, where GRP was fully embraced in teacher-training colleges, there is consistent evidence of a change in the gender dynamics in school and in the behaviors and attitudes of girls and boys in the classroom. This has improved learning, as girls and boys no longer have unhealthy competition but support each other to learn.

Discussion of the Results

Gender-responsive Pedagogy (GRP) Practicing Status of Science Teachers

The analyzed and interpreted data revealed that GSS science teachers in the setting were found to be successfully facilitating a GRP track. Explicitly, they identified four themes of GRP: language use, classroom setups, classroom interaction, and addressing sexual harassment. They satisfied both male and female students' particular interests in their practice of the four elements of the pedagogy. In relation to this point, Njuguna (2016) stated that attitudinal, behavioral, and practice changes were observed in teachers with gender reflective instructional processes, and also increases in girls' access to education was obtained in some sub-Saharan African countries.

However, the study's data depicted that science teachers in the setting were reluctant to have gender-responsive (GR) lesson plans, teaching materials, and GR management of sexual maturation (Njuguna, 2016). The degree of gender-sensitive pedagogical teaching practice was very low, as is common in most developing countries. Such traditions of using gender-biased or prejudiced classroom approaches cannot satisfy the growing demand for diversified needs of students (Jabbour, 2013).

Science Teachers GRP Practices in Relation to their Sex and Teaching Experience

The current study was also initiated to examine how science teachers exercised GRP in relation to their gender and teaching experience, and the analyzed data revealed that neither the teachers' gender nor teaching experience affected their GRP practices. Male and female teachers facilitated the pedagogy in the same manner since males scored nearly equally as females did. This similarity was confirmed by the teachers' interview responses.

Furthermore, the qualitative data revealed that both male and female science teachers tried to satisfy their students' needs in their instructional activities. They treated their students fairly in terms of asking questions, advising, and assessing their academic performance without discrimination. So, it is possible to say that maleness or femaleness did not influence science teachers' GRP practicing roles. This result substantiated the findings of Amro, Mundy, & Kupczynski (2015), Igberadja (2016), and Olayemi (2018). They reported that neither teachers' age nor gender affected students' academic performance. However, as Nnamani and Oyibe (2016) argued, male teachers scaled up girls' academic performance better than boys. Inversely, in Mulji's study (2016), girls who were taught by female teachers gained significantly higher scores than boys. In their studies, Onah & Ugwu (2010) and Aktaş, Kurt, & Aksu (2013) also affirmed that both gender and teaching experience predict the teaching process positively and significantly. Conversely to these studies, the present study indicated that teachers' sex did not make a statistically significant difference in their GRP practices, i.e., male and female teachers played similar roles in their treatment of students' gender.

In light of teaching experience, the analyzed data showed that science teachers facilitated the GRP similarly across all levels of teaching experience categories: low, medium, and high. This finding could possibly lead to the conclusion that teachers' teaching experience didn't affect teachers' GRP implementation. Likewise, Zhang (2008) validated how the years of teaching experience didn't influence students' academic achievement in science. As she briefed, teachers with a greater number of years of teaching experience were no more effective in exercising the pedagogy than those with a lesser number. However, research by Kini and Podolsky (2016) portrayed that teaching experience is positively associated with students' achievement gains. According to Wekesa (2013) and Ewetan & Ewetan (2015), as the number of teachers' years of experience increases, students' academic achievement also increases and vice-versa. In general, the current research findings specified that there was no significant relationship found between teachers' teaching experience and their ability to enact GRP in the classroom.

Implications of the study

Based on the discussion made above, science teachers in the research setting played their GRP roles significantly in the classroom organization and classroom interaction, and they were effective in tackling sexual harassment in their school compound. A focus on gender-responsive pedagogy ensures increased participation. For transformative learning to take place, all learners need to be assisted to participate effectively in discussion and group work, and gender-responsive pedagogy helps to ensure that goal. This increased interaction benefits both female and male students, with a particularly noticeable impact for female students. Gender-responsive pedagogy contributes to the achievement of the sustainable development goal.

Conclusions

This study looked at gender-responsive pedagogy in Ethiopia's secondary schools. From the findings, the paper concludes that teachers increasingly used gender-responsive pedagogy for teaching the core subjects such as biology, chemistry, physics, and mathematics. The proportion of both female and male secondary school teachers who demonstrated gender-responsive pedagogy in their teaching also increased over the period. A framework for supporting gender-responsive pedagogy within secondary school educational institutions in low-resource or low-infrastructure environments would enable both teachers and their students to become gender-responsive professionals.

On the issue of performance across the subject areas by teachers, the study found that both male and female teachers used gender-sensitive learning strategies. These findings have implications for policy in many ways. For instance, the use of gender-responsive pedagogy should continue to be encouraged across all subject areas in the curriculum to deepen its practice among tutors and mentors, so they can assist and guide student-teachers to use them as well. In the programs organized by Ethiopia Education Service and the Ministry of Education, teachers should be mandated to use gender-responsive pedagogy in their teaching and it should be included in basic and secondary school curriculum.

One area that requires serious revision is the textbooks in use in schools. It is important that the textbooks which the Ministry of Education approves for the implementation of curriculum should be in line with the application of gender-responsive teaching and learning strategies. Required textbooks for schools should receive a prior review so that these books ultimately accommodate and comply with gender-responsive teaching. Also, teachers' guides and training manuals to guide teachers on how to teach the various subjects in the curriculum should integrate a gender-responsive pedagogical approach. It is worth mentioning that the issue of tutor's misconceptions of some aspects of gender-responsive approaches needs to be addressed. Trainees need to be prepared to address challenges arising from cultural bias and stereotypes that pupils learn at home.

Recommendations

In view of the conclusions made, the researcher offers the following recommendations:

- Science teachers should understand concepts of gender-responsive pedagogy because it may help them to treat boys and girls equally in their teaching.
- Teachers should prepare and use gender-reflective lesson plans and instructional materials, particularly to help youths in understanding sexual matters.
- Teachers should receive short-term and long-term training regarding concepts and application of GRP practices.
- Schools, district education offices, zonal education departments, regional education bureaus, and the Ministry of Education should make secondary school teachers aware of GRP implementation practices. These stakeholders need to inform science teachers about

how to motivate girls to learn science subjects and to make their classroom activities more gender-reflective.

- Schools should offer a platform for teachers to share their experience. For example, the school can organize training, seminars, symposium, panel discussion, and workshops for teachers.

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