

'CHANGING OF PARENTS' PERCEPTION IN EDUCATING FEMALE STUDENTS IN NIGERIAN SCIENCE

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ABSTRACT

Parents are considered as the most vital influence for the education of female students, there has been a vast area of research on how science education is perceived by parents and society in general. In Nigeria, the parents' mindset about the education of female students is not encouraging. Thus, this paper presents the results of impact of carrying out science home projects by five female students on their parents' perception of their daughters' science learning. The home project is part of a science module in a bigger study. Data were collected from interviews with the female students and their parents and observation during the implementation of the home projects. The interview was done after the home project. The interview data was transcribed and analysed using thematic analysis. The data was triangulated with the observation field notes. The result reveals that the parents' mindsets are positively changed. We also point out the implication of the of this study and the future researches about the education of female students is suggested. The home projects were found to be helpful to makes parents to see the importance of learning science by their female daughters so that they can change their thought and enrol more of their daughters to secondary school to learn science and further their studies at higher institution.

Keywords: *parents' perception, female students, science*

INTRODUCTION

Apart from the role teachers played in making science learning more encouraging, the practical involvement of the parents is also having a positive influence on the students' science academic achievement. For the socialisation of any individual, parents are the most vital elements (Frome & Eccles, 1998). Therefore, the impact of parents on students' interest and attitudes is considered as one of the important key elements to their academic achievements in science (Dalhatu, 2013; Dryler, 1998; Nwachukwu, 2012; Rena, Abedalaziz, & Leng, 2018; Whalley, 2017). This impact has been found to influence career preference particularly when it emanates to non-traditional professions particularly for female (Dryler, 1998). For instance, it has been found that the absence of parental reinforcement and expectation did not encourage girls' interest in a scientific discipline (Benasich, Brooks-Gunn, & Clewell, 1992; Clewell, 1992). In addition, researchers have found that parents can play an important role in increasing the daughters' interest in learning science (Burke & Mattis, 2007; Benasich et al., 1992; Corbett, Hill, & Rose, 2008; Jeffers, Safferman, & Safferman, 2004) particularly when parents are involved in the education of their daughters (Egun & Tibi, 2010). This is due to the research evidence that parental involvement in learning science through activities and homework was found to play a significant role in students' academic achievement (Van Voorhis, 2003). This can make them provide more support to their daughters to study science (Andre, Whigham, Hendrickson, & Chambers, 1999).

This support contributes to their scientific achievement significantly (Maple & Stage, 1991). However, in Northern Nigeria, it is a different story as indicated in the previous literature.

LITERATURE REVIEW

In Nigeria, the parent's role to encourage their daughters to study science is a different story. This is because parents prefer their daughters to attend Islamic schools since they believe that the preservation of their religious and values helps them perform their traditional roles (Ogunjuyigbe & Fadeyi, 2002). The female also bears the responsibilities of taking care of sick parents and younger siblings (Randell & Gergel, 2010). As such, female students are found to develop a psychological perception of being uninterested in learning science (Besecke & Reilly, 2006; Buck, Leslie-Pelecky, & Kirby, 2002; Skamp & Logan, 2005). Moreover, there is a lack of confidence in studying science (Pollack, 2013). For instance, a study conducted in Nigeria found that there is a lack of parental awareness of the importance of science among female students (Egun & Tibi, 2010). This is because the attention on girls is only connected with providing income to the family by way of being food vendors (Akinbi & Akinbi, 2015). As such, education for female students are neglected by their parents right from birth (Abbagana, 2013). In fact, some of the parents feel disappointed if they bear a female child as they are born first. The worse is when all the children in the family are all females (Uyanga, 1995). Scholars also proved that in Nigeria, the causes of this inability for girls to study science include the sociocultural practice against females such as early marriage, household responsibilities, religious, and lack of parental encouragement (Njoku, 2000; Okafor & Anaduaka, 2013; Randell & Gergel, 2010; Zakka & Zanzali, 2015). This leads to female students having anxiety and ended up not being interested in learning science (Heaverlo, 2011). As such female students are found to develop a psychological perception of being uninterested in learning science (Krapp, 1999; Pollack, 2013). Emphasis should be given to encourage parents to enrol their female children to study science (B/Tudu, 2011) because, the overall success of a child depends largely on the influence of his/her parents (Davis-Kean, 2005; Nwachukwu, 2012).

This situation inhibits girls to pursue science and technology, particularly in rural areas (Bank, 2010; Nwosu, Etiubon, & Udofia, 2014). Therefore, this affects their chances of getting admission into universities and colleges to study science, technology and engineering fields (Egun & Tibi, 2010). That is why more boys are study courses like science, medicine, engineering, architecture and so on, while the girls only study to become secretaries, teachers, designers and so on (Angeline, 2011). This leads to the low number of female graduates in the scientific field who can work in the science industries which can cause Nigeria to be unable to accomplish its mission to have enough number of scientists by 2030 (Alaba & Adekomi, 2012).

Hence, in this study, the main issue of concern is that female students in Nigerian secondary schools are facing a challenge in learning science such as lack of parental encouragement which affects their enrolment and performance. Thus, there is the need to provide an avenue in which parents can realise the importance of learning by their daughters right from the secondary school level so that their mind and thought towards their female students can be changed to encourage and enrol more of their daughters to secondary school and study science. In this paper, the researchers tried to provide a means through which parent's might consider change on their negative perception of educating female students in Nigerian science education. The changing of a parent's perception for their daughters to learn and perform excellently in science can only be achieved when parents are also involved in and collaborated in the activities (Adams, Harris, & Jones, 2018; Castro et al., 2015).

METHODOLOGY

This is a qualitative study. The instrument used in collecting the data was an interview protocol which consisted of 7 open-ended questions. The interview protocol was cross-checked and validated by experts in the fields of science education. Initially, ten questions were submitted to the experts but finally only seven questions were found suitable to elicit the information. Appointment with the parents to carry out the home projects were set. Before the carrying out the home projects, the parents were briefed on

the purpose of the home projects and consent were obtained from the parents. The female students started the home project by explaining the objectives of project that they were going to do. While doing the projects, the female students explained about the concept and procedure of the projects. The parents were encouraged to do the home projects together with their daughters. The execution of the home projects was videotaped and field notes were recorded. After the home project finished, the parents were interviewed to get their feedback.

The home projects were part of the developed science module which was designed using the Gagne's nine events of instruction (Gage, 1979; Gagne, 1962). Elements such as religious, culture, history and health were incorporated in the module, thus, the home projects are related to the elements of culture and religion of the community. The home projects are the application of the concepts learnt in the classroom from the module. All the parents agreed that their daughters would do the projects and the researcher is free to enter their houses for observation and recording and were reassured that they are ready to participate in the study. Five sets of parents were selected and participated in home projects.

The criteria used in selecting the parents were the parents should (a) be ready to be present during the home projects by their daughters (b) have already their daughters studying science in secondary school (c) from the locality where the study was conducted. The instructional guide on how to carry out the projects was given to the 5 female students and their parents were informed and explained on their roles, and the aim of the activities and projects. Pseudonym name were used for the participants. Each female student carried out 5 different home projects;

The qualitative data collected were transcribed and analysed based on the Creswell (2008) procedure. Using six stages; preparing and organising the data; exploring and coding the data; describing and forming the themes; representing and reporting the findings; interpreting the meaning of the findings, and validating the accuracy of the findings.

The rigour was ensured by using triangulation of several data and methods were used; adequate engagements, member checks and audit trail. The validity is concerned about parading the reality of the results (Merriam, 2009; Merriam & Tisdell, 2015).

FINDINGS AND DISCUSSION

This section discuss the findings of the parents after the home projects about learning science by their daughters. The findings showed that the parents gave positive responses after the home projects done by their daughters. They also mentioned that they were impressed with the home projects carried out by their daughters where they applied the scientific concepts learnt from school, local materials and projects' guide. The parents also responded that the projects are relevant to them and their community. This makes them changed their minds about their daughters, as such they said that they will give chances, equal right, and support as they do give to their sons to study science and enrol them to tertiary institution science. The themes that emerged were (1) Acquiring application skills (2) Community Relevance from the aspect of culture and religion (3) Expectation of daughters' future. These themes are further discussed in detail.

Acquiring of Application Skills

This theme is about the reaction and perception of the parents on the application of the scientific concepts learned from the science lessons and carrying it out the home projects and described it to their parents. After the home projects, both the daughters and parents were interviewed about their feelings and their perception about the home projects. For example, Dausi who carried out a home project entitled; "Rotation of water through stages (Water is a special gift)" mentioned;

".... Hmm, I was able to carry out and describe the water cycle project to my parents. Also, both my father and my mummy assisted me during the project by doing the hands-on activity".

(I 1, Line 1-4, 6th September 2017, 2:00 PM)

It was also observed that Dausi used local cooking pots, charcoal, water, local cooker and carried out the stages of the water cycle and described it to her parents with assistance from her mother in setting up the project. The parents assisted her possibly because they had never seen Dausi doing any home projects with their local materials, that is why they even assisted her during the project.

The parents were interviewed about the projects, and both the father and the mother responded differently. For example, when asked about why he felt happy and encouraged by his daughter, Usmi (The father) mentioned;

"..... My daughter used charcoal, clay pot, clay plates, plastic, local cooking cooker show us the stages and the process of the water cycle, this kind of activities I never see it before. Even my sons never do it before, that is why I was motivated and interested throughout the activity".

(I 1, Line 1-4 15th September 2017 4: 20 pm)

This showed how the projects stimulated Usmi to the extent that he did not feel worried about their daughter studying science, he was excited to see that his daughter carried out the home project. Consequently, the mother (Inna) have different answers when asked with the same similar question.

Inna responded with;

"... Hmm...Because now I have the believe that Insha'Allah our daughter is performing well in the school in the field of science. She can even do more projects which are relevant to our daily life since she was able to carry out this one".

(I 1, Line 4-7 13th September 2017)

This indicated that the parent felt intrigued to help out and does not feel awkward to help out even though they does not know much about science.

This is in line with the findings of Campbell and Mandel (1990) and Castro et al. (2015). Their findings found that only when the activities were carried out by their children, which involved parents that in turn are supportive, will in turn resulted in a positive outcome of the actual students' performances.

Community Relevance from the Aspect of Culture and Religion

After the home projects, the parents were asked about the relevance of the projects for them and their community. All the parents responded that the projects are essential to them and their community. It can be seen from the excerpts of one of the interviews conducted with one of the parents whom daughter carried out a project of Human modelling (The flow of food). When asked about the relevancy of the projects for them and their community, Jamil who was the mother mentioned;

"... Yes, because the project will assist us in knowing how the food flow, that the food we eat must pass through various regions in our body and it must be digested can be useful in our bodies. Therefore, improper eating of food is not good for our health".

(I 1, Line 10-13, 15th September 2017)

This indicates that the usefulness of the project makes parents notice that the manner of the feeding habit of their community is bad, thus, need to be changed. In support of the parents' perception about the relevancy of the project, their daughter (Zeebe) responded with an almost similar answer to what her parents said. When Zeebe asked about the relevancy of the project, she mentioned that the project is relevant to them.

In her own words Zeebe mentioned;

"... The project I carried out which is "Human Modelling" will assist our people, because it will show them that eating food improper is not good since the food is eaten most pass-through stages before it can be used in the bod."

(I 1, Line 3-5, 8th September 2017)

Another response from another parent, Usmi (father) whose daughter carried out a project entitled; "Rotation of water (water is a special gift)," mentioned different reasons about the meaningfulness of the project. Because, Usmi mentioned; "We saw the stages of the water cycle which are stated in our religion." On the other hand, Inna added that;

"..... Even in our religious the miracle of the sky and the entire water cycle itself was mentioned. Moreover, now I have seen that studying science by our daughter is highly important not only to us but also to our community".

(I 1, Line,13-16 13th September 2017)

Therefore, the findings under this theme revealed that by carrying out and described home projects that is familiar with their culture and religious beliefs to their parents were found relevant to the parents and community in changing their culture to positive dimension and used it in doing their religious activities. This finding is consistent with the findings of Egun and Tibi (2010) and Dalhatu (2013) who found that the relevance to the culture and religion have significant influence in assisting the parents to realise the importance of science.

The Expectation of Daughters' Future

After the home projects, both the parents and daughters were asked about their plans for the future. The parents' responses were positive concerning their daughters' future plans. The parents responded that they have good plans for their daughters to further her study in the tertiary institutions and to study different scientific fields. This was the parents of (Hani) whose daughter carried out a home project entitled: "Construction of Human modelling where the food flow, digested and absorbed." Hani mentioned;

"..... I promised that would not marry her to someone after her secondary school. I will ensure to give her all the necessary supports to study science. I want her to study something on diseases or medicine because I want her to work in the hospital so that she can have a brighter future and we can be proud of her."

(I 1, Line 1-3 14th September 2017)

Another family, the father, Muzzil mentioned implied that he will let her daughter choose the path that she wants depending on her results. This indicated the father's confidence in his daughter and encouraged her to pursue further studies by giving her freedom. Muzzil (the father) mentioned;

"..... Depends on her results after the examination only then she can choose which field to pursue in the tertiary level"

(I 1, Line 1-2, 12th September 2017)

The findings imply that the change of the parents' perception towards positive direction benefit their daughters and not sticking to their former beliefs and tradition that female is good to be just a wife and mother only. They want them to further their studies to the university and colleges to study further and believed that the female students are also capable to do well in science so that they can assist them and the entire community. In support of this, parents are found to have confidence and prepared good plans for the career's future of their daughters in science if they see the relevance of learning science and evidence that female can also do well in science (Frome & Eccles, 1998; Scott & Mallinckrodt, 2005).

In a nutshell, it is interesting that the home projects in a practical role stimulated the parents on the importance of science. In general, the findings showed that the parents' perception after the home projects were positive, since they appreciated the home project that their daughters did, which make them mention that they will give equal opportunity, encouragement and chances, and their sons and daughters to enrol to the secondary school to study science. These findings are consistent with the literature (Burke & Mattis, 2007; Corbett, Hill, & Rose, 2008; Frome & Eccles, 1998; Hudson, Comer, & Kendall, 2008; Jacobs et al., 2005; Jeffers et al., 2004; Simpkins, Davis-Kean, & Eccles, 2006) that with given exposure and involvement with their daughters learning science, then the parents will come to see the importance of science for their daughters.

CONCLUSION

In the Nigerian settings, parents are not involved in educating their daughters to learn science right from secondary school, Thus, it is important to involve parents of a particular community where the importance of science can be demonstrated to and by their daughters so that they can open up and change their mind about the education of their daughters. This is the way this study tried to make parents to see the importance of learning science by their daughters and changed their negative perception.

IMPLICATIONS OF THE STUDY

The study will have religious implication in the community where science is slowly bridging into religious. Thus, this will make parents and daughters see the importance of learning science because science is related to religion. The study also has a cultural implication to the community because the culture of the community was infused in the module. This also makes the parents and students perceive the importance of their culture in science, and they saw that science did not abound in their culture. In addition, since the home projects were related to the daily life and religion activities of the parents and the entire community of the district where the study was conducted. This makes parents change their culture of marrying their daughters early, not enrolling them to study science. Now parents can develop a great ambition to further their daughter's studies to the universities and colleges.

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