TUTORING AND PARENTING INFLUENCE ENGINEERING: IMPACT ON FEMALE TEENAGERS

A.A. Busari[1], J.O. Okeniyi[1], G.O. Bamigboye [1], I.T. Tenebe[1], B.I. Oniemayin[1], T.O. Durotoye[2]

[1] Department of Civil Engineering, Covenant University (NIGERIA)
[2] Departments of Mechanical Engineering, Covenant University (NIGERIA)

Abstract

Tutoring and parenting to great extent assist in harmonizing the capabilities of students, both play key roles in influencing the career choice of teenagers especially the female. This research assessed the influence of parenting and tutoring on the career path (CP) of female teenagers with special focus on the selection of engineering as a course. This was achieved with the distribution of 1000 questionnaires to girls in the senior form (SS1 – SS2) of some selected secondary school in Southwestern Nigeria, using face to face approach. Besides, focus group discussion approach was also employed in the data collection. Data on tutoring, parenting, subject mastery, counselling and individual factors were collected, sorted and analyzed. Statistical software SPSS Version 21 was employed in the analysis of the data. The result showed that parenting and tutoring had a pronounced impact on the academic performance of the girl child and to a large extent influenced the selection of Engineering as a course. The most effective mode of tutorship are the appointment based and drop-in tutoring with 30% and 35%. The analysis of the result revealed that 30% of the tutored students picked interest in engineering as a course while only 16% of the non-tutored showed interest engineering. The result of this research will be of tremendous help to school owners both private and government on the strategies to adopt in encouraging tutorship in secondary schools in an attempt to encourage girl child into the engineering profession.

Keywords: Parenting, Tutoring, Counselling, Engineering Profession, Girl Child, subject mastery, Engineering Education.

1 INTRODUCTION

Parents play a pivotal role in the choice of career selection of their children as well as tutoring. Most times parents and teachers are incapable of meeting the educational demand of their child or students principally offering Science, Technology and Engineering related subjects; this usually affects the academic performance of such child. As a result the need for tutorship is crucial. Tutoring encompasses the efforts to improve learning by helping students to improve their learning strategies in an attempt to encourage independence and empowerment. Tutors just come up alongside a student and help him/her to understand how to apply what they have learned (Mcwilliams, 2014).

Tutors provide assistance to some individual that hires them in some subject the student is struggling in which is always the case in science oriented courses. It is commendable to be aware of child's interest and as such helps in achieving that goal.

This is important because studies showed that making more satisfying careers is dependent on student's competency towards career decision making (Keller 2004), which the presence of tutors can solve. Also, of a very paramount influence is parenting as the same author asserts that students who are showed affection and support develop more confidence in their efforts choose career (Keller, 2004). This also calls for caution because parent must recognize that their role is simply to act as a facilitator in their child's career journey and allowing independent career choices to mark a young person's first real step into adulthood. Wolff and Tinney (2006) pointed out, that within an institution the academic and social experience of a student may be more vital than individual-level predictors such as prior academic experiences, background characteristics, or personality. Research further affirms that peer and faculty interaction especially on undeclared students contributed positively to their academic performance. (Pascarella and Terenzini, 2005). According to Flowers, (2006) tutoring provides an interactive and academic experience that helps students especially the undeclared student to retain more academically. Furthermore, tutoring offers a collaborative, systematic, interactive, individualized and more successful learning practice. Also, it acts as an academic booster by improving the academic performance which in turn increases the self-esteem and confidence level.

Reinheimer and McKenzie, (2011) avers that the positive influence of tutoring cannot be over emphasized.

It is surprising that most parents want their children to practice the same profession they are involved in especially if it is a lucrative, famous or family like. They do this for so many reasons such as the fear of the unknown with other profession, the need to pass on the acquired knowledge and skill to other generations.

The gender gap in engineering as a profession calls for a serious attention especially in the developing world where they are grossly underrepresented. Disadvantaged groups of students such as African American and Hispanic, both female and male, may not have access to engineering and technological related courses in high school. Consequently, it will have a negative impact on their academic performance especially in STEM majors in college (May & Chubin, 2003; Frizell & Nave, 2008; Tyson et al., 2007; Perna et al., 2009).

In an attempt to bridge this gap there is a need to examine the intriguing factor that can boost the representation of the girl child in STEM related courses as seen in Nigeria; this invariably will improve girls' participation in engineering as a profession. Hence this study elucidates the impact of mentoring and parenting in the selection of engineering as a course with special focus on the girl child.

1.1 Methodology

This research evaluated the influence of parenting and tutoring on the selection of engineering as a course in secondary schools in Nigeria with special focus on the girl child. This was achieved by the use of a detailed questionnaire. Moreover domiciliary information gathering technique was also adopted for assessing data from some parents as regards the approval of their girls in engineering as a course.

This was backed up with focus discussion group to pick up the opinion of the girl child on the parenting and tutoring.

The categories of students assessed are:

- The tutored Students.
- Non Tutored Students.

1.2 Sampling

The opinions of senior cadre students (SS1, SS2, and SS3) were used for the purpose of data collection. The research was restricted to the STEM taking classes alone as these were the only class privilege to select engineering as a course.

Five Hundred detailed questionnaires were randomly distributed to the three categories of secondary schools in Nigeria Viz:

- Day Schools
- Public Schools
- Private Schools
- Government owned schools

1.3 Procedure

Descriptive statistics was used for the analysis of the data, this was achieved by the use of SPSS version 21 and Microsoft excel for the data analysis. Comparative assessment was also conducted based on tutoring and parenting.

2 RESULTS AND DISCUSSION

Drop-In Tutoring method accounted for 25 % of the respondents who desires to study engineering. This technique of tutoring is majorly for student who prefers to study on their own and so does not have a permanent timetable. Appointment base tutorship seems to yield a very good result on the girl child as the highest percentage of the students who wish to pursue a career in engineering are on the appointment base method. The group tutorship method accounted for 24% (Figure 1). This may be as

a result of the effect of peers as different student from different back ground and schools meet during the group tutoring method. Due to the advancement in technology, most students now with the help of their parents or older adult adopted the E-tutoring technique. The percentage now seems to be on the increase compared to some few decades ago where a very high percentage of Nigerians are not computer literate.

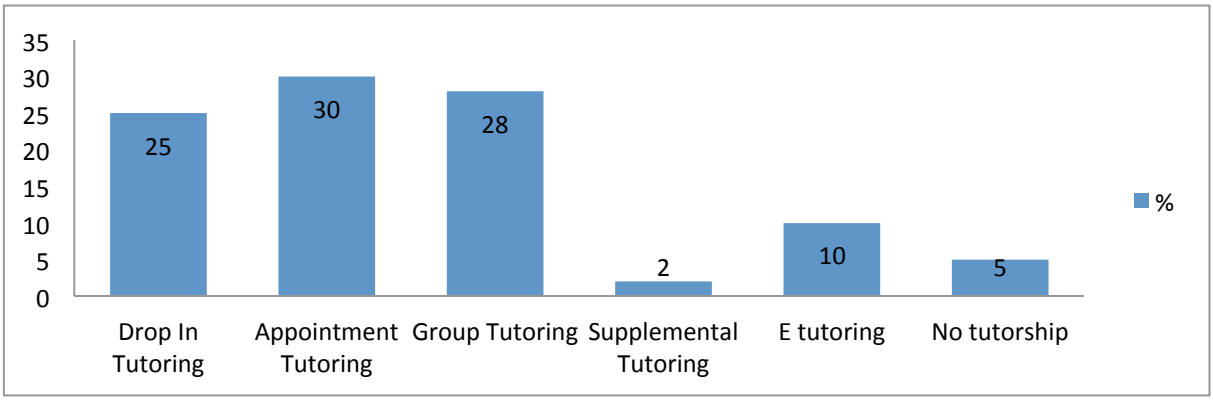


Figure 1: Tutoring Technique.

2.1 Effect of tutorship on Science and Engineering subject mastery

Tutorship to a large extent affects the mastery as well as stirs the interest of female secondary students towards STEM related courses. As most of the tutored students in the STEM classes chose engineering related subjects as their best as compared with the non-tutored students. Physics as a subject has the lowest percentage of respondents. Most of the female students see it as very difficult to understand. The 14% recorded for tutored students as accounted by the interviewed students is as a result of the personality of the teacher or the tutor. This stirred up the interest in the subject. Consequently, Physics is one of the back bones of engineering special attention should be given to the subject so as to improve the interest of the girl child which will in turn have a positive effect on the selection of engineering as a course .This becomes necessary in a bid to bridge the gap between the two gender in the nearest future.

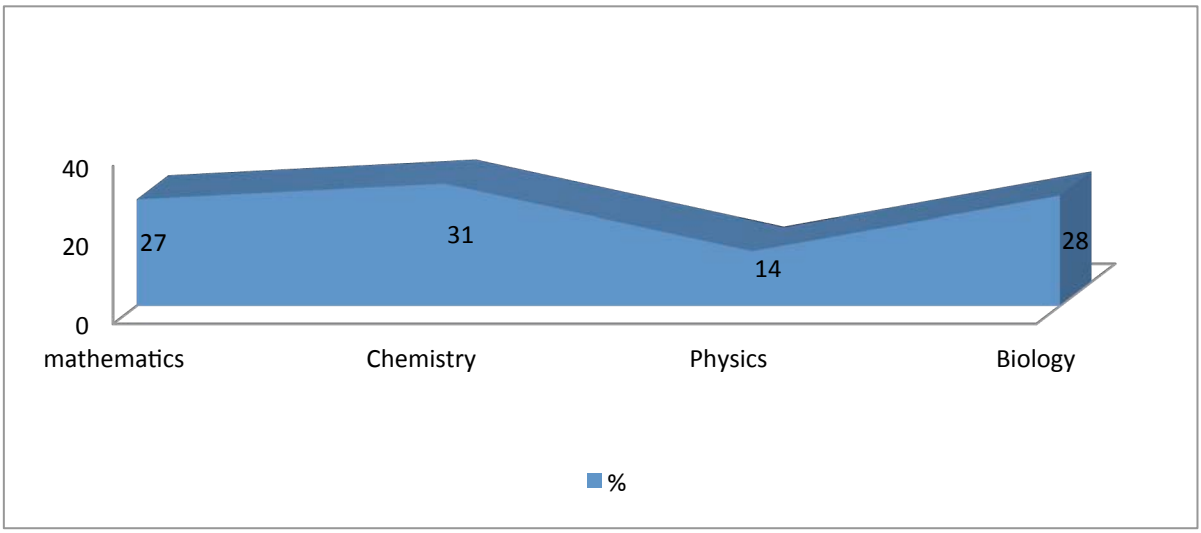


Figure 2: Preferred subjects of tutored female students.

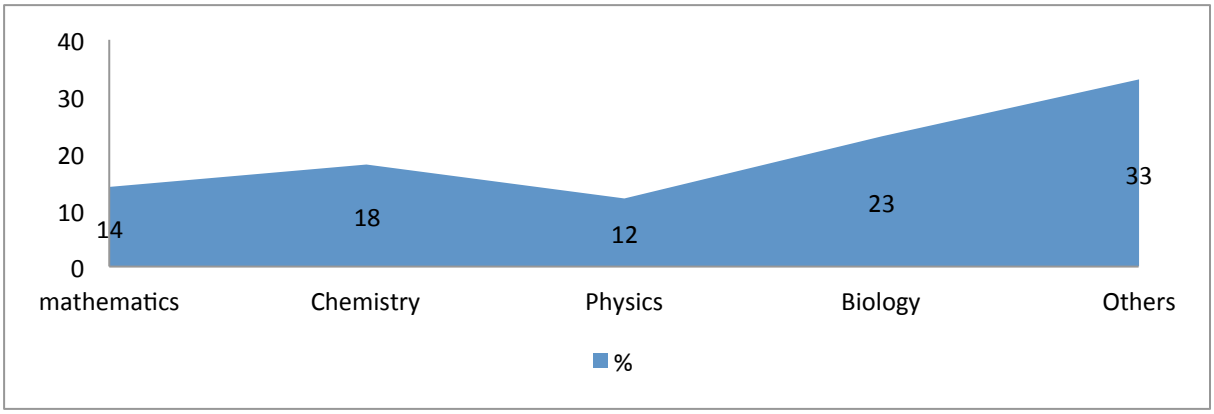


Figure 3: Preferred subjects of Non tutored female students.

2.2 Course Selection of Tutored and Non Tutored Female Science Students

The analysis of the tutored students showed that 30% picked interest in engineering while 16% of the non-tutored selected engineering. This indicates that tutorship had appositive effect on the selection of engineering as a course. Most of the respondents prefers medical and sciences with 33% and 31% for tutored and 37% and 41% for non-tutored respectively as seen in figure 4 and 5. This is because of the general believe that engineering as course is masculine in nature. Hence engineering bodies in Nigeria and Africa at large should put in more efforts in motivating and educating female secondary school students on more representation of female in this unique profession.

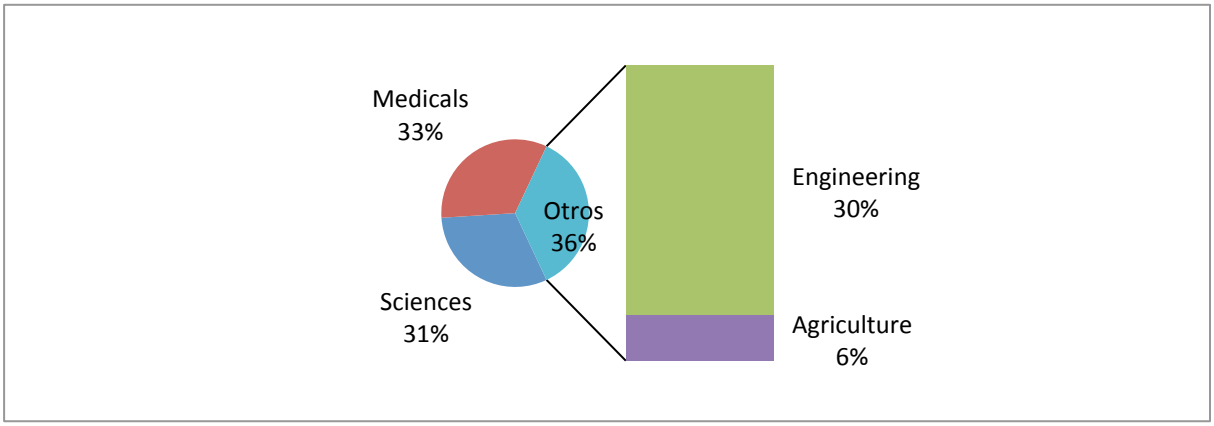


Figure 4: Course selection of tutored female science students.

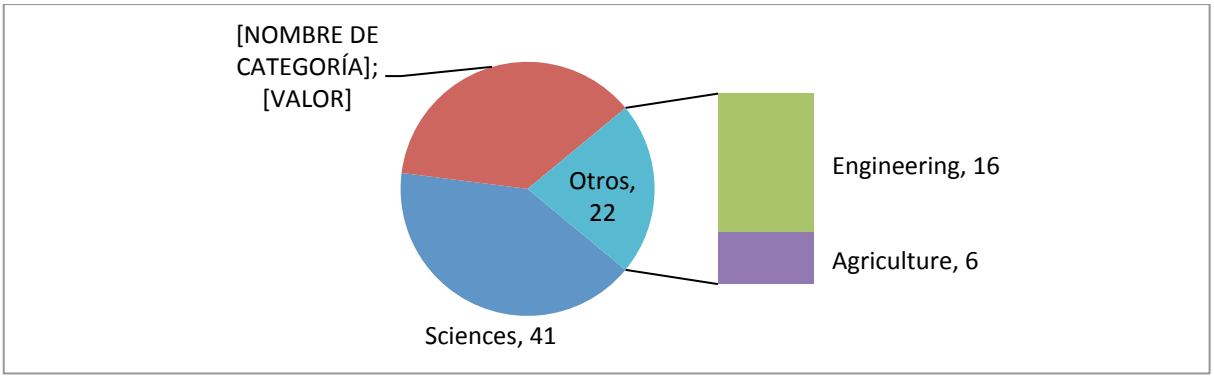


Figure 5: Course selection of tutored female science students.

2.3 Factors Affecting Course Selection

Different factors motivated the choice of the course selection. Parenting accounted for the highest percentage of the reasons why 41.5% of the female students considered, engineering as a course. This buttressed the findings of Atkins (2013) which states that almost four in 10 women engineers had a family connection to the occupation, most frequently their father, and 11 per cent had a friend who was an engineer. Taken together, this suggests that the influence of close family or social factors can play an important role in encouraging girls into engineering. Interest of the students accounted for 21% while teaching and tutorship accounted for 19%. Peer factor had the least percentage as seen in figure 6.

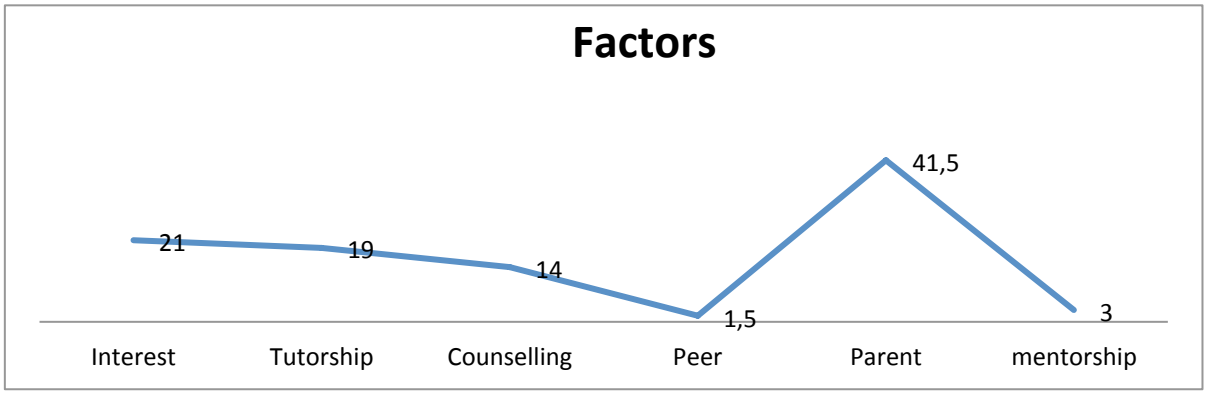
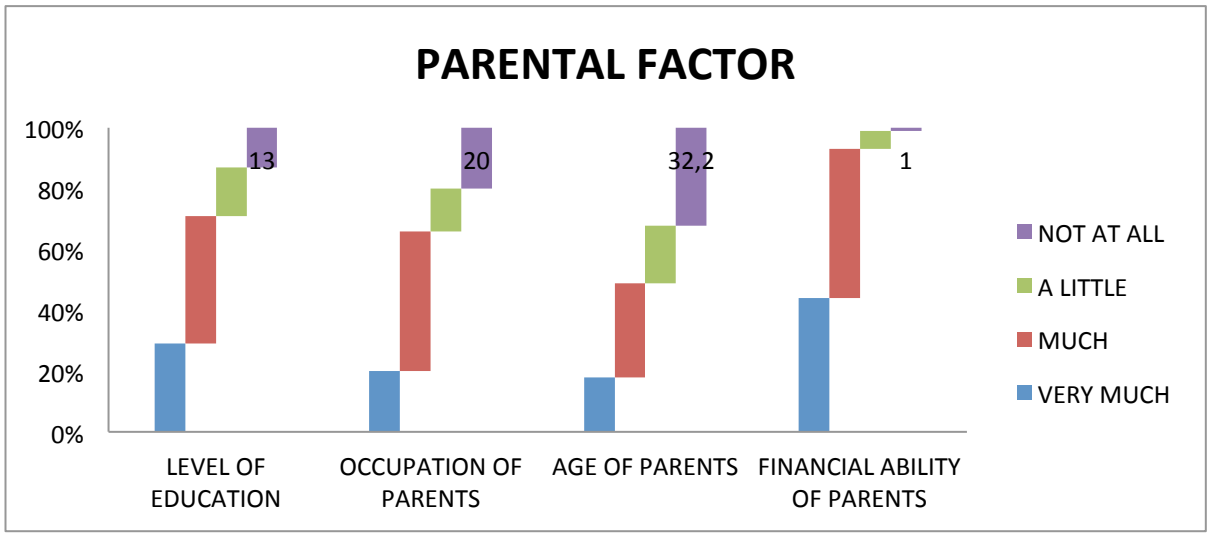


Figure 6: Factors affecting the choice of course selection.

2.4 Effect of Parenting on Course Selection of the Girl Child

Level of education of parents, financial capability and parent's occupation to a large extent affected the career selection of the respondents. Children of educated parents showed great interest in engineering as compared with the uneducated and semi educated. This can also be buttressed with the findings of this research as seen in figure 7. Age of parents had the least affect course selection.



3 CONCLUSION

Tutoring to a very large extent affects the selection of engineering as a course. The most effective mode of tutorship are the Appointment based and drop-in tutoring with 30% and 35% respectively while supplemental tutoring had the least. Also tutorship to a large extent affects the mastery as well as stirs the interest of female secondary students towards STEM related courses. Despite the efforts of tutoring, physics had the least percentage of preferred subjects by both tutored and non-tutored student with 14% and 12% respectively. Comparative assessment of the two categories of students

showed that 30% of tutored students picked interest in engineering while 16% of the non-tutored showed interest in engineering. Parenting accounted for the highest percentage of the reasons why 41.5% of the female students considered, engineering as a course.

Level of education of parents, financial capability and parent's occupation to a large extent affected the career selection of the respondents.

3.1 Recommendation

Physics is one of the back bones of engineering, hence special attention should be given to the subject to improve the interest of the girl child. Ultimately, it will have a positive effect on the selection of engineering as a course. This becomes necessary in a bid to bridge the gap between the two gender in the nearest future.

REFERENCES

[1] David Reinheimer and Kelly Mckenzie (2011) Impact of Tutoring on Student Success Journal of College Reading and Learning, 41(2), Spring. https://www.pierce.ctc.edu/dist/tutoring/ref/files/2015/Faculty_Information_Flyer.pdf

[2] Frank McWilliams on Mar 12, 2014) www.nfo.methodtestprep.com/blog/bid/109351/3 Differences-Between-a-Teacher-and-a-Tutor assessed 4th of January, 2016.

[3] Frizell, S., & Nave, F. (2008). A preliminary analysis of factors affecting the persistence of African-American females in engineering degree programs. Paper presented at the American Society for Engineering Education Annual Conference, Pittsburgh, PA.

[4] Heidi Keller, Relindis Yovsi, Joern Borke, Joscha Ka¨rtner, Henning Jensen, and Zaira Papaligoura (2004). Developmental Consequences of Early Parenting Experiences: Self- Recognition and Self-Regulation in Three Cultural Communities Child Development, Volume 75, Number 6, Pages 1745 – 1760.

[5] May, G. S., & Chubin, D. E. (2003). A retrospective on undergraduate engineering success for Underrepresented minority students. Journal of Engineering Education, 92(1), 27–40.

[6] Pascarella, E. & Terenzini, P. (2005). How college affects students: A third decade of research (Vol. 2). San Francisco, CA: Jossey-Bass.

[7] Tyson, W., Lee, R., Borman, K. M., & Hanson, M. A. (2007). Science, technology, Engineering and mathematics (STEM) pathways: High school science and math Coursework and postsecondary degree attainment, Journal of Education for Students Placed at Risk, 12(3), 243–70.

[8] Wolff, M. K., & Tinney, S. M. (2006). Service-learning and college success. Academic Exchange Quarterly, 10 (1), 57-61.