

# *A girl with a dream becomes a woman with a vision: A study on influence of female role model for young girls (8-15) in STEM from different countries*

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**Abstract**— This paper processes the integration of other studies and our findings indicates that a female role model is having a positive influence on young girls falling under the age 8 to 15 effectively, in the field of Science, Technology, Engineering & Mathematics (STEM). Also, the importance of an extra outsourcing influential force for the girls of that age to explore in these fields, that to in respect of different cultural background, as it relates to diversity in HCI. Additionally, the necessity of considering the implications of different cultures, especially regarding the gender roles. The methods consist of surveying young girls of age 8-15 from different schools of India, Bangladesh and Germany. The survey incorporated a series of questions regarding their role model and their career aspirations. Moreover, to know the psychology of the students about the selection of their career choice and the person they admire, teachers of the respective classes have been interviewed. Surprisingly, the outcome is amazing and positive. 70% of the girls prefer to choose a female as their role model. Hence, from this study, it can be concluded that there is a positive influence of a female role model on young girls belongs to this particular age group.

**Keywords**— Role Model, Young girls, Psychology, STEM.

## I. INTRODUCTION

From the childhood only, everyone start to learn values, ethics and life lessons. As the people grow, they meet different people in different stages of life with different age groups. These values and lessons could be learnt by Parents, Friends, Teachers, Lifepartner, Actor/Actress or even Children[1]. To be successful in life personally as well as professionally, it also matters on the person whose characteristics and methods someone perceives and follow their footprints. Who could be your model.

As mentioned by great American sociology Robert K. Merton, role models could be any particular person who plays as a paragon in someone's life and can be imitated as model for specific roles. These people do not have to be a famous star or a perfect person but can be found in their own day to day environment who can convey an impression of what is possible at work life as well as in personal life. They inspires and motivate you to fully exploit your own life potential.

In the psychology of learning, role models are considered to be an essential part of the socialization process. In social learning theory, also known as social cognitive theory, Bandura states that: 'modelling has always been recognized as one of the most appealing means of transferring the values, attitudes and patterns of thought and behaviour.[2]

### A. Literature Review

No doubt, before anyone else comes in life, Parents are the first ones who teach their children the vital aspect of life and plays a major role to fetch belief and strengthen the behavior of their child directly or indirectly in number of ways by giving rules, perspectives and principles through interaction and communications. [3][4].

According to a study, the advantages of role models for enhancing the educational performance of stereotyped individuals is depends on three assumptions. Firstly, a role model must be perceived as competent [5]. Secondly, stereotyped individuals need to perceive the role model as an ingroup member. For instance, some of the past studies shows that the effects of role models are more constructive when stereotyped person and role models are having the same gender or racial group membership [6][7][5][8]. The reason behind this, as these role models can influence faith, they can overlook the effects of negative stereotypes related with their group[1][5]. Lastly, followers should be aware of the role model's success field, like where the role model's group is negatively stereotyped so that they can have a positive impact on performance [7].

When it comes to the children's, the findings by Biskup and Pfister in Berlin, which says boys and girls both prefer to choose role model in mass media. Television film figure, actors, singers and music groups as well as sportsmen and sportswomen, while they have the less influence from the people in their direct social environment. Additionally, another vital source of children for an idol role models is the characteristics of their idol for instance, superiority, strength, bravery for

boys; appearance and positive social behaviour in case of girls.[9]

Another interesting study has been done for the adult girls to influence them to be an athlete through a sports role model in Australia. The outcome shows that, only around 8.4 percent of girls chose a sports person to be their role model, whereas more percentage of girls adopt a role model from the family (mother), peer or entertainment domains [10].

### B. Females in STEM Field

A Research has been made by Microsoft in early 2018 for women falls under 11 to 30 age in various parts of Europe, which show that the number of girls almost doubled when they are exposed to a role model to motivate them in STEM. Although, women are less interested in the STEM field as compared to males, but drastically increasing with time at an almost double rate. [11]

### C. Female role models

It is assumed that, it is necessary for people to know that someone like themselves has been able to achieve success, to motivate them to accomplish for similar goals. It has been found that women depends on and having benefits from same-gender role models more than opposite gender. The National Longitudinal Survey of Youth (NLSY) (a panel data set with approximately 12,000 respondents aged 14-22 in 1979) discovered that an increased presence of female faculty and staff has positive influence on female students to gain their educational achievement. [12]. Additionally, according to the experiments conducted in paper “Role-Model Influence: Effects of Sex and Sex-Role Attitude in College Students” [13] it is concluded that females were more swayed by female models in their selection of career as compared to males.[14]

An imbalance in situation is that, Women are less likely to pursue career in Science, Technology, Engineering, and Mathematics (STEM) fields than men [15] despite the fact that when women stands equally beside men for quantitative ability and experience[16]. According to an explanation put for the gender inconsistency in STEM involvement, women doubt their abilities to be successful in these fields [17]. As specified by a study, exposing the women to a STEM role model or someone who is successful in these fields is a common method to show that they can be successful in STEM [7][9].

## II. METHODS

In the first method, all the findings are merged with the psychological literatures & other research studies regarding the influence of role models. Second method is, girls falling under 8-15 age have been surveyed from different schools of Germany, Bangladesh and India. The last method consists of conducting an interview with teachers from the respective schools, to know the psychology behind young girls’ thought about the

selection of role models, subjects and career path girls loves to choose.

## III. RESULTS

In total, 150 young girls have been surveyed from different countries includes Germany (30), Bangladesh (75) and India (45). In the second method, the results has been classified into three parts and presented on the basis of countries , age groups and subjects.

### A. On the basis of countries

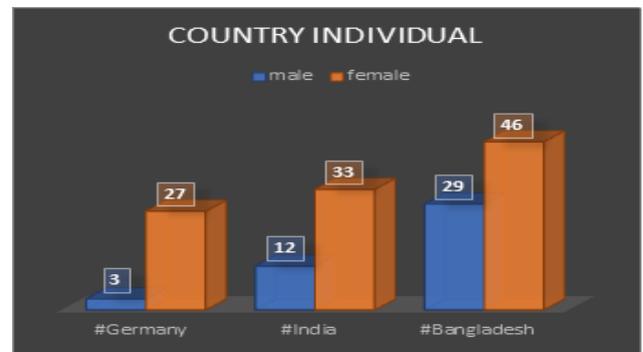


Figure 1 : All countries

When it comes to countries altogether (Germany, India, Bangladesh), when asked about role model/ inspiration, 70% of the girls prefer to choose a female role model over a male which was only 30%. When talking about countries individually, as shown in fig.1, number of female followers are drastically higher than males. The percentage of female role model selection is considerably greater in Germany(90%) and India (73%) as compared to Bangladesh (61%). The major reason behind this could be, girls from Bangladesh are refrained from studies and going to schools and colleges. As per the news published in the local newspaper of Bangladesh on 12 January 2019, Islamic hardliner Hefazat-e-Islam chief and chairman of Befaulq Madarisil Arabia Bangladesh “Shah Ahmad Shafi” announced that “Do not let girls study at schools and colleges. At best, you can allow them to study up to fourth or fifth grade.” [18] Hence, most of the girls didn't get the chance to study up to the higher level and therefore, there are comparatively fewer women at very good positions in Bangladesh who can exemplify as a role model for others.

### B. On the basis of Age

When the study has been done with respect to age, together for all the countries, the result varies between the age group (8-11) and (12-15). As the maturity level changed, their level of thinking and answering, moulded accordingly. As shown in fig 2, the number of girls belong to age group 8-11 selected family member (not specific to gender). For instance Mother, Grandmother, Father, Brother and Sister, rather than selecting the person who is not around them since they are more close to their family members. On the flip side of the coin, the girls who

belong to the age group 12-15 picks the person who is a motivational speaker, a writer, a sports person, a singer or a teacher as they have more exposure to the real world compared to the girls who belong to the age group 8-11.

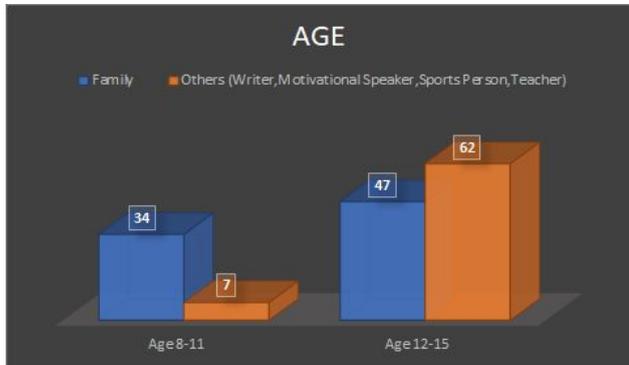


Figure 2: Age group division into (8-11) and (12-15)

For example, a girl from India who belongs to the group 12-15 adopted that her role model is “Malala Yousafzai” [19]. Furthermore, two girls of age 13 from India wants to pursue their career in the sports field and their role model is “Saina Nehwal” [20]. Therefore, maturity is one of the factors which can be seen from the result while choosing a role model.

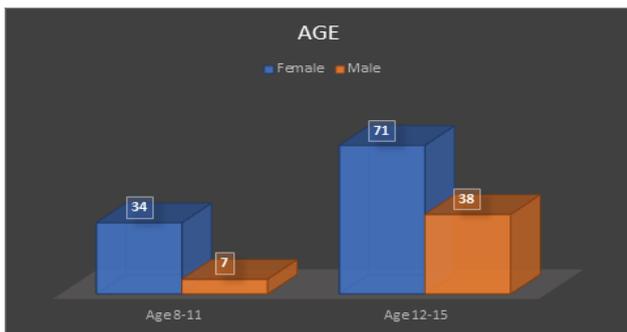


Figure 3 : Age group division into (8-11) and (12-15) on the basis of gender.

Curiously, there is a sense of similarities between both the age groups. As shown in fig 3, the percentage of choosing female role model is 4 times and 2 times higher than males in 8-11 and 12-15 age groups respectively. Therefore, females are more popular than males among both the groups.

### C. On the basis of subjects

In regards with Subjects, preference by young girls is shown in fig. 4. 44% of the girls specified their favourite subjects are related to STEM and 56% as Other subjects, for instance, English, Language, Music and Sports.

When considering subjects individually as Science, Maths, Technology and Others, the distribution is quite uneven. As shown in fig.4, 19% of the girl's favourite subject is Math and 21% is Science. Rest 4% and 56% goes to Technology (Computers) and Others respectively. Here, it has been observed that most of the girls choose their favourite subjects on the basis of effective lecture

delivering by the teachers and the affirmative behaviour of the teachers towards their students.

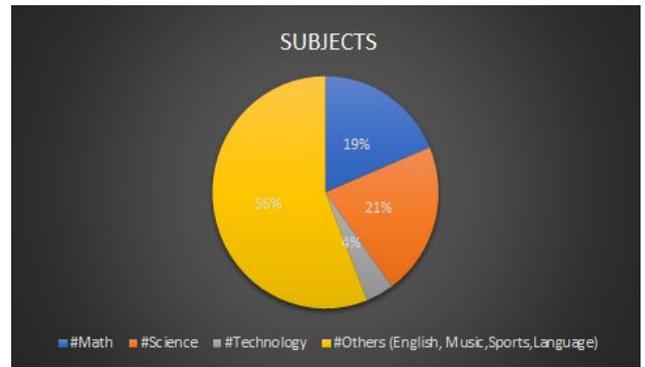


Figure 4 : Subject division into STEM and Others

The more positive lecture given by the teachers for a particular subject to their students, the more they get the good marks and more they like that subject. The other observation which has been made here is “Visualization”. For instance, As mentioned by a teacher from Bangladesh, when asked the reason for selecting a particular subject (Science) by most of the girls, “When this survey was conducted there was a science exhibition going on in their school. Inspired by observing all those excited experiments in science fair they preferred Science as their favourite subject.” From this scenario, it can be predicted that young students of this age perceive motivation and enthusiasm by visualizing activities around their environment and make the selection.

From the third method, the feedback provided by teachers after they interact with the girls is amusingly incredible and bolster to complete the study.

When the survey has been done in rural areas of Bangladesh and asked a female teacher about the selection made by the girls for their role models, she stated that:-

*“When I interacted with the girls and asked about the reason behind their selection, two girls from my class said that they were forced to get married at this very early age (13). No one from their family members came forward to rescue them except their mothers, hence their mother turns out to be their ideal and Superwoman”.*

When the same question has been asked to a teacher from India, she states that:- *“One of the girls from my class (age 14) articulate that her mother is a single mother. Also, she was the only person who was earning and support for her studies. That is why her mother was her inspiration.”*

Then asked a question to a teacher from a school in Germany about the selection of subjects (especially English) by the girls then she stated that:- *“I am amazed that a small girl of 11 years from Germany could select her favourite subject as English. As before this survey we never asked about a student's priority.”*

Lastly, the experiences of the survey have been shared by the teachers from all the three countries individually. And the overall feedback they provide is recorded:-

*“We never had this kind of conversation with our students with this age group. Before this survey, we didn't have any idea about their role model, their favourite subject and career aspirations. By having this conversation, we, first of all, came close to our students especially girls. For the first time, we got the opportunity to discuss something out of syllabus and to know about their needs like they also need some external force of energy (role model) to grow in life mentally also, rather than only focussing on bookish knowledge.”*

#### IV. CONCLUSION

To conclude, based on this study selection of role model among age group 8-15 depends on certain aspects. Firstly, the maturity level. It can be seen from the results that the girls stand between the age 8-11 choose their role model among their family members and girls from 12-15 choose a person from their outside environment, also related to the career they want to pursue.

Secondly, it depends on environmental and background conditions. The girl belongs to the rural area, is having less exposure from the outside world. Since they have fewer facilities from which they can access the knowledge of the exterior living world. On the other hand, girls from the metropolitan city are more outgoing and active in terms of the technical world. Hence, limitations in Technology is one of the major reason due to which a girl living and studying in a rural area not able to choose the role model from outside their family circle.

Irrespective of all these differences, a young girl between the age (8-15) prefer to a female role model over a male because as a sense of psychology they could easily connect mentally as well as emotionally to a woman and could perceive a woman's characteristics efficiently. Hence, from this study, it can be concluded, there could be a positive influence of a female role model on young girls belongs to the age group 8-15.

Another favourable outcome from this study is, no matter what is one's aspiration is, either Engineering, Writer, Teacher or a Doctor. One could learn and influenced by a role model who belongs to any kind of field. For example, a girl who wants to pursue her career in STEM could get inspired by her mother who could be a homemaker or a woman from a non-technical background, for example, a Writer.

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