Challenging Gender Discrimination and Bias: Analyzing the Role of Early School Educational Intervention as a Sustainable Solution

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Abstract-Given: (a) that biased behavior leads to gender discriminatory practices, which are a colossal barrier to sustainable development; (b) the evidence that intervention is mandatory for prevention of biased attitude, we have analyzed the role that educational can play in facilitating the prevention of biased attitudes. In our experimental study, we have investigated the impact of a structured, curriculum for "Valuing Inclusion & Diversity" on 240 students aged 8-10, participating in pre-test, 20 weeks of intervention via a taught program, followed by post-test, for both control and experimental groups. Tolerance scale & stereotyping measure tests were used while T-statistics and ANOVA were employed to identify mean differences. Our results undisputedly indicate higher levels of acceptance & tolerance and lower levels of biased/stereotypical attitudes, following this intervention, on both genders. Based on these findings, we recommend: (a) structured program, for early school years, will play a significant role in reducing bias (maximum improvement-41.6%) and enhancing acceptance among learners (maximum improvement-24.4%); (b) it is necessary to conduct research to determine the level of correlation that exists between intervention and its impact in a range of cultural settings; (c) on concluding such research, it may be used to form the basis of policy/law making.

Index Terms—activity-based curriculum, early school education, inclusion, bias, acceptance, tolerance, stereotypes, T-Statistics, ANOVA

I. INTRODUCTION

In most of the developing countries, women are treated as second class citizens [1] and one of the living examples is Pakistan which has been coming across this issue since it got independence in 1947. Women's lives are controlled and shaped by various gender discriminatory structures in Pakistan. Their contribution to the production and physical hardships are not acknowledged. A woman suffers in education, health and gender biased feeding and recreation practices. According to The Global Gender Gap Index Report 2015, Pakistan has been ranked 144 out of 145 countries in women's participation in all sectors of life [2]. These gender discriminatory practices can be colossal barrier to sustainable development.

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As a human being, she is denied her own identity. In some parts, she is considered as a product owned by her brother and father before marriage and then by her husband. She does not have the power to make a decision for her life. Someone else takes decisions on behalf of herself about marriage, education or giving birth to a child. It is sad to see such behavior in our society and thus we have to address and challenge this issue [3]. All these problems were exacerbated by the advent of extremism and terrorism in Pakistan (Girls were brutally murdered on the roads just for raising their voices to get education and there are many other examples like this) [4]. Many researches have indicated that our values leading to actions are the reflections of our mindset [5]. [6]. Gender discriminatory mind set is the real problem in our society and we need to change that mindset through education. This the only way to address the root cause of the problem.

Stakeholders of education are recognizing that imparting gender education in children, from an early age, is now a needed invention [7], [8]. Gender discrimination practices are affiliated with culture and changing cultural practices requires a lot of effort and reinforcement [9]. The natural next question, then, is when and how to work on mindsets to eradicate gender discriminatory practices. This question has been answered by many social and natural scientists, where they suggested that early childhood (age 6-10) is the most crucial period of one's life. Early childhood period is most significant because it provides a strong foundation for rest of the life. Intervention during early childhood can change the life (quality) trajectory of an individual [10]. Through these years, children forge a personal identity and self-concept [11]. Children, especially in their early childhood period, have an ability to readily acquire knowledge and skills. In this process, education (and by extension, educational institutions) play a key role [12].

No substantial work has been done in Pakistan to develop and deliver any module for raising awareness regarding gender equality among children. On the other hand, an analysis of text books and curriculum material in Pakistan has shown that these books feature male as dominant character [13]. Most of these studies indicate that "Sitting in the same classroom, reading the same textbook, listening to the same teacher, boys and girls receive very different education" [14] and that these experiences have a negative impact on girls' educational attainment [14], [15].

Our study is an attempt to investigate the impact of structured program called "Valuing Inclusion & Diversity". This program is focused on activity based formal teaching of basic inner values linked to respect, acceptance, tolerance, equity, fairness and equality. We believe that inculcating inner values has a linkage with solving gender equality problem and we do not foresee any retaliation on account of be offensive for culture/religion. The examples used in the program are gender and stereotypes related in order to let pupils: relate to the issue at hand and understand the importance of tackling this issue. In order to draw relevant and actionable results, we have used T-Test and ANOVA to evaluate the mean differences between the pre-test and post-test scores to identify the significance of impact of intervention on basic inner values & gender stereotype behavior.

II. MATERIALS AND METHODS

A. Experimental Design

Ouasi-experimental design was used to conduct the study with pre and post-tests [16]. Before giving treatment (i.e. intervention through a structured taught program), a pre-test was conducted. After pre-test, all intact groups from Grade-3 were given treatment, so that some students should not feel themselves being deprived from the treatment. The treatment was in the form of structured, taught and activity based curriculum, which, we called "Valuing Inclusion & Diversity". This model curriculum was designed by combining various models and techniques i.e. Philosophy for Children (P4C) [17, 18, 19]; EQUATE project findings [20]; Fragmented Frameworks [21]; Growing up Global [22]; Opening the Black Box [23]. This treatment was given for twenty weeks and then post test was conducted to analyze the impact of treatment. The design of study is represented in Fig. 1.



Figure 1. Experimental design of Study

B. Sampling

Five sample sets were taken from five different schools in various areas of Rawalpindi, Pakistan (Fig. 2). Each sample set included 48 children (ages 8-10). A total of 240 children participated in the study - 123 boys and 117 girls. Data of only 20 children per sample set, with identical numbers for both genders, who were present at the time of both pre and post-tests, was analyzed.

C. Instrument of Study

Two instruments were used in this study to conduct pre and post tests in order to measure the changes in biased and stereotypical behavior. Tolerance scale test [24], [25], including a standardized questionnaire, was used to quantify the level of acceptance, tolerance, equality & inclusive behavior and stereotyping measure test [26], [28] was used to quantify, gender biases & stereotypical attitudes. This measure was intended to tap children's stereotyped attitudes, the items had to reflect shared beliefs in this culture about the groups "men" and "women". The neutral items were, therefore, those consistently judged neutral.



Figure 2. Map indicating sampling points at different sampling sites

III. RESULTS

We carried out this research to study the impact of "Valuing Inclusion & Diversity Curriculum" (VIDC) (the only available structured program being implemented at an educational institution) on stereotypical & biased behavior of early school children.

A. Impact of VICD on Inner Values

Results on tolerance scale shows that practical understanding of inner values has improved in all sample sets across all five schools, irrespective of gender (see Fig. 3) (here, inner values are depicted as: acceptance, tolerance, equality & respect). In the sample set, the range of individual improvement is from 2.2% (min) to 24.4% (max) and average mean improvement is 10.58%.



Figure 3. Pre-test and post-test scores for inner values

Maximum average improvement was observed in the samples taken from school-4 i.e. 17.4%, however minimum improvement was observed in school-1 i.e. 8.1%. Boys showed higher rate of mean improvement i.e. 11.7% as compared to girls, for which mean improvement was 11%. The pre & post tests scores were higher for girls (26.2 & 31.2 respectively) as compared to boys (24.82 & 30.08 respectively). Post tests indicated that intervention is more effective on boys in all 5 schools (see Fig. 4).

	Paired Differences							
				95% Confidence Interval of the Difference				
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1 Pre-Test 1 - Post-Test 1	-5.000	2.219	.593	-6.281	-3.719	-8.432	13	.000
Pair 2 Pre-Test 2 - Post-Test 2	-2.429	1.555	.416	-3.326	-1.531	-5.844	13	.000
Pair 3 Pre-Test 3 - Post-Test 3	-6.357	1.946	.520	-7.481	-5.234	-12.225	13	.000
Pair 4 Pre-Test 4 - Post-Test 4	-6.500	1.506	.403	-7.370	-5.630	-16.145	13	.000
Pair 5 Pre-Test 5 - Post-Test 5	-3.357	1.499	.401	-4.223	-2.492	-8.379	13	.000

TABLE I. PAIRED SAMPLE TEST FOR INNER VALUE



Figure 4. Percentage improvement in practical understanding of inner values

Impact of VIDC on Biased & Stereotypical Behavior: The results of gender preference test revealed improvement in gender biased and stereotypical behavior with higher scores in post-test, irrespective of gender. Range of individual sample improvement is from 8.3% to 41.6%. Average mean improvement is 23%.



Figure 5. Pre-test & post-test scores for biased & stereotypical behavior assessment

Overall improvement in boys (23%) is slightly higher than girls (22.3%). Average pre-test & post-test scores for girls, i.e. 5.7 & 8.4 respectively, are higher than boys, i.e. 5.4 & 8.1 respectively, at all 5 locations. Except one school (school-3), where percentage improvement is higher in girls, post test results discovered that percentage improvement in boys is higher than girls (see Fig. 6). However the absolute scores of girls are still higher than boys.



Figure 6. Percentage improvement in biased & stereotypical behavior

B. Overall Trend

It is observed that this intervention has brought more improvement in biased & stereotypical behavior as compared to the practical understanding of inner values. However both aspects showed improvement (see Fig. 7).



Figure 7. Percentage improvement – Inner values & gender preference (based on gender)

In schools 1, 2 & 3 increased rate of improvement in inner values showed improvement in gender preferences scores and reflected a direct relationship. Improvement in school-2 was higher than school-1 and improvement in school-3 was higher than school-2.

Maximum improvement in inner values was observed in school-4, however maximum improvement in biased & stereotypical behavior was observed in school-3. Minimum improvement in inner values was observed in school-1 and minimum improvement in biased & stereotypical behavior was observed in school-5, see Fig. 8.



Figure 8. Percentage improvement - Inner values & gender preference

C. T-Statistics & ANOVA

T-Statistics and ANOVA were applied to the data of all three tests to find the mean difference between the results of pre-test and post-test. The results of T-statistics and ANOVA for both tests revealed that the maximum level of significance i.e. p-value = 0.00 & 0.13 for tolerance and gender preference test respectively, which is < 0.05. This indicates that there is a significant difference between the mean scores of pre-tests and posttests. The confidence interval of the difference for both tests was found to be 95% (see Table I).

IV. RESULT INTERPRETATION

After intervention, the impact was significantly high amongst both genders. This result is supported by another study conducted by Shyer & Adey in 2002 [29], where social skills were developed in the children of age 5 through interventions provided over a period of one year. Many other studies have revealed that the improvements in practical understanding of values, biases & stereotypical behavior are directly linked to the intervention, not to non-specific factors [30], [31].

Improvement in boys is found to be more, as compared to girls. This is also consistent with the study [32]-[34] which indicated that brain growth patterns of girls and boys are different. The decrease in the growth of boys' brain does exist, beginning at about 4.5, 7.5, 9.5, 12 and 15 years of age. These decreases are followed by rapid increases called "spurts". Another study [35] reported that brain spurts in boys occur at 6-8 years and 11-14 years, which supports the results of our study, as children between age 7-8 were taken as an experimental group. This result is also supported by another study conducted by Geravis (2011) [36], which showed that how boys who participated in the awareness building workshops showed heightened improvement as compared to girls.

On average, the control experimental data indicated that the base level of girls was higher than boys. This is due to the fact that the brain spurt in girls occurs in ages: 1.5, 2.5, 7.5, 10.5, 14.5 & 16.5 years [37]. By the time they had reached age 8, they had already gone through three brain spurts versus boys, who had only two brain spurt after 4.5 & 7.5 years of age [32].

In three schools, improvement in inner values is directly related to improvement in biased and stereotypical behavior. Higher improvement in practical understanding of inner values depicts higher improvement in biased and stereotypical behavior. This is also supported by another study [38] which revealed that informal training to develop attitudes of inclusion and tolerance play a significant role in reducing biased behavior. This study also supports the finding that overall rate of improvement in biased behavior is higher than inner values.

Based on this research: (a) it is conclusively clear that structured intervention enhances basic understanding of inner values which is linked to reducing biases and stereotypical attitudes; (b) it can be reasonably deduced that improvement level is not directly correlated with the base level skill; (c) it can be intuitively determined that while prolonged intervention is expected to lead to a continuous improvement, the process of enhancement of skill development is not likely to be linear.

V. CONCLUSION & RECOMMENDATIONS

Based on previous research and our study, our conclusions and recommendations are as follows:

(a) Introducing a structured and well-researched educational program, for early school years, will play a significant role in developing acceptance, tolerance, unbiased & non-stereotypical attitude among learners. The maximum improvement observed after 6 month intervention was: (1) for inner - 24.4% & (2) for biased & stereotypical behavior - 41.6%. The results indicate improvement and reveals that continuous intervention, for at least five years (from age 6 – 11) can lead to significant change in behavior;

(b) Average mean improvement for inner values is 10.58% & for biased & stereotypical behavior is 23%, which clearly indicates that the process for bringing improvement might be slow because there are a lot of environmental, social and cultural aspects contributing to biased and stereotypical behavior. But continuous intervention in formative years can make a difference;

(c) The intervention, we designed, was 45 minutes long – once in a week. Increasing the intervention period from once to twice or thrice in a week can enhance improvement levels;

(d) It is necessary to conduct an expanded research in determining the level of correlation that exists between preventive intervention and its impact in a range of cultural settings;

(e) On concluding such research, it may be used to form the basis of prescriptive policy and law making for changing the early education curriculum to include mandatory "Valuing Inclusion & Diversity" as one preventive intervention against bias, gender discrimination & stereotypes.

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S. Taimur has 8+ years of experience in social and development sector and her passion is to bring change and put her efforts in developing the third world through education and working for human rights. Having studied Environmental Sciences & Education Planning & Management (Postgraduate Degree) followed by an international publication, she has remained a member of Silver Oaks Schools & College System for 5

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She has an experience of: community work at National Cleaner Production Centre, Guest appearance in social development talk shows and internship in Ministry of Environment. As an educationist, she has co-authored original researches, on educating for global citizenship & sustainable development, which were presented internationally. Sadaf has initiated various environmental projects in 20 schools. "Organic Gardening" activity was also implemented in two other schools in Peru and UK, in collaboration with British Council. She has designed awareness building modules: "Climate Change Mitigation & Adaptation" for Rural Development Center, Cameroon and "We Care" for Tanzania Youth Culture Exchange Network. She ran a team to design Oakian Global Citizenship Program for Silver Oaks. She is currently working with Idara-e-Taleem-o-Aagahi (NGO), where mobilizing youth to raise voices & take action for "Right to Education" under Education Youth Ambassador (EYA) Program. She is also a Youth Delegate for Pakistan at UNESCO – MGIEP.

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