Volume 3 Number 1, 2016
ISSN: 2006 - 2192

Journal of the Centre for Gender and Social Policy Studies, Obafemi Awolowo University, Ile-Ife, Nigeria

AFRICAN JOURNAL OF GENDER AND DEVELOPMENT

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Volume 3 Number 1, 2016
April, 2016

ISSN: 2006 - 2192

A publication of
Centre for Gender and Social Policy Studies
Obafemi Awolowo University, Ile-Ife, Nigeria

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Cover/Inner design & Printing by
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African Journal of Gender and Development is the Journal of
the Centre for Gender and Social Policy Studies,
Obafemi Awolowo University, Ile-Ife, Nigeria.
It is an inter-disciplinary journal that focuses on issues
relating to gender and development in Africa.

Editorial Board

Editorial

Articles in this volume are no less pulsating than those in previously published volumes. In line with the mandate of the Centre for Gender and Social Policy Studies, the current volume addresses broad and topical issues in gender and development studies. Opening the discourse is Ogunsanwo's article, which engages the murky politics of the womb through the lens of teenage pregnancy. The author implicates patriarchal dynamics policing adolescent sexuality that fosters sexual ignorance among teenage girls as a sign of innocence and purity. Ogunsanwo notes that blame-the-victim posture of many parents does not only wreck more emotional havocs on teen mothers but also offers no protective cover to potential victims. The author warns that such attitude can reverse gains in girl-child education and exacerbates maternal health conditions in Nigeria. The educational and maternal health concerns raised by Ogunsanwo's article are furthered in Mbada and Mapayi *et al'*s articles. Mbada demonstrates how inadequate political priority and commitment of Nigeria's government to maternal health have continued to lead to negative health outcomes across the country. Mapayi *et al,* on the other hand, show that suicidal ideations and attempts are on the increase among in-school adolescents. The authors observe that while female-gender had more suicidal ideations, male-gender had more suicidal attempts. Igwe *et al* show that the female-gender involved in street hawking suffers more sexual abuse than her male-counterpart and is thus more exposed to the scourge of HIV/AIDS. Ajayi and Gambo argue that self-concept and knowledge are good predictors of attitude towards HIV/AIDS among in-school adolescents.

Akano *et al* turn our attention to gender issues in adults' world of work. The authors indicate that abdominal obesity seems to be significantly higher among female meat-sellers than their male-counterparts. Similarly Aminu *et al* demonstrate that health consequences of child-labour in agriculture are more telling in female-headed

households. Ajibade shows that some Christian films create negative stereotypes of the female–gender. Banjo and Oworu argue that such stereotypes manifest in the real world like sport arena in forms of negative body image, sexual harassment and abuse. With respect to production, Adeuyi *et al* show that both male and female genders contribute to value additions in tuber-value chains. Ume argues that consulting and involving more women in technology development and transfer will boast production. Sanusi *et al* advocate capacity-building training for women farmers as a sure way of improving their productivity capacities.

Ekine and Arigbabu indicate that the use of gender sensitive methods such as story-telling and games in science classes would increase girls' interest while Banjo argues that women have organisational and managerial skills necessary to enable them provide leadership in sports.

Contents

PERCEPTION OF SCIENCE TEACHERS ON THE USE OF STORIES AND GAMES TO ENHANCE GIRLS LEARNING IN BASIC SCIENCE

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ABSTRACT

The study examined the perception of science teachers (pre –service and in- service) on the use of stories and games in science classes as these two strategies have been documented to be gender sensitive in favour of girls. For the purpose of the study, a 24-item questionnaire was administered on teachers. The research design was a pre-test post-test quasi experimental. Results obtained showed that there was a statistically significant difference between the teachers' perceptions on gender sensitivity, use of stories to teach science before and after the intervention ($t = 3.55$; $df = 92$; $p<0.05$). Also there was a statistically significant difference between the teachers' perceptions about the use of games ($t = 4.13$; $df = 92$; $p<0.05$). Furthermore, the result showed that the years of experience had significant effect on their perceptions as to whether stories or games can be used in the classrooms while gender had no effect. The study thus recommended that gender sensitivity trainings be conducted for teachers regularly and they should be encouraged to use gender sensitive methods like story-telling and use of games in science classes to increase girls' interest.

INTRODUCTION

Scientific skill is a must in this 21st century for creativity and relevance on the job for young school graduates irrespective of gender. It serves as a basis for increasing manpower, especially in careers that are tagged as Science, Technology, Engineering and Mathematics (STEM)-based. As a nation , Nigeria, and in order to pursue the government's Vision 20:20, it is advocated that our education should produce the needed technical and vocational skills that can make us more self-reliant in sectors like, agriculture, oil and gas, computer engineering and, healthcare, among others for economic growth (FMST,2012). Without the relevant skills the rate of unemployment will increase and we will keep on hiring skilled manpower from other nations. (Okonjo Iweala, 2012)

Nigeria's teeming population with 80.5 million women/girls serves as a huge potential for developing workforce for the 21st century in oil/gas, manufacturing, engineering and agriculture where 60-90% of the farm work are done by women (UNESCO,2010). In addition, since women bear the major health burdens of the family, a basic knowledge of science will help in reducing maternal death, infant mortality

and increase earning power for the women. As an emerging economy Nigerias need both males and females to have technical skills to effectively manage and sustain her development. The more women that are educated and have a background in science the better options they would have in form of career choice later in life (Claire Crawford & Jonathan Cribb, 2013).

It is adequate to argue that the under-representation of women in education generally, and in the wide field of science and technology in particular, has been given deserved attention in the last three decades. As a result of this worldwide attention, continued efforts have been made to find solutions to the fewness of women in the field. Giving impetus to these efforts was the placing of increased importance on science and technology for national economic development. Also important was the influence of the growing commitment to equality of men and women as a tool of national development. On the average, according to UNESCO report (2010) from 121 countries, only 29% of the world's scientists are women and this underrepresentation is more obvious in the developing nations with Nigeria having only 17% female science researchers. Science and technology as a learning domain has been identified as crucial to lifelong learning of children and it has the ability to develop cognitive and non- cognitive skills in children, which is related to latter life skills.

Several causes have been identified for women's low participation in science and technology among which are:

the assumptions that society makes about males and females (their abilities, behaviours, roles, and aspirations);

the objectives and organization of education;

the practice of science, technology and mathematics.

These factors, are embedded in the political and cultural context of society

This disparity sets in at the basic level of education subtly with fewer girls embracing science and science-related subject and these begin to show up from upper primary classes to the junior classes before they get to higher classes where they choose their course of study (Ekine, 2013, Ekine, 2010; Olagunju, 2001; Stipek, 2005).

Another dimension to the leakage of girls in science classes is the teacher factor in the process of learning which is key to effective teaching and learning. According to Arigbabu and Mji (2004), the school, directly or indirectly, encourages stereotypical behaviours; and teachers also consciously or unconsciously exhibit gender biases in their classrooms. This is also alluded to by (Cain, 1980; Rubble & Martin, 1998). Some of the actions of teachers in the science and mathematics (Sowunmi& Aladejana,2013) classes connect negatively with the female gender and thus make them conclude that they either have no place in science at all or that they may never go far in this field. Pupils also start to develop

negative attitudes to the subject at this period.

This has been responsible for the mass under representation of female students in higher institutions studying STEM .courses. Gender biases manifest in teacher-student and peer dynamics. Studies show that boys are given more time to speak, manipulate equipment and tend to dominate group activities in science classes (Brenner, 1998, Popoola, 2002). Parents are equally guilty of these biases as they tend to assign boys to what they regard as "complex and more demanding tasks" while girls are made to "handle easy and less demanding" tasks in science classes.(Arigbabu and Mji, 2004,)

However, research has equally shown that girls can be encouraged to take core science courses and have high achievement if the right strategies and motivation techniques are given. Some of the strategies that have been found effective for girls include training of teachers on gender issues and gender sensitivity, (Stromquist, 2007; Sinnes, 2004) use of non- competitive methods like story-telling (Olsen and Gross,, (2013) Sheppard, 2004) games, cooperative learning and mentoring. These have been documented extensively in Latin America, Lesotho, Cape Verde and Zimbabwe. In Latin America, a national training module was developed for teachers and this was used over a period of time in training and retraining and for some teachers to serve as role models to others from the trained cohort. In addition, in Zimbabwe a role model reader's booklet was produced on careers where men were overrepresented and given out to girls in schools. The results showed that out of the 45 girls in the treatment group, 73.3 % changed their original career aspirations (Tichatanga, 2007).

GENDER SENSITIVITY AND SCIENCE ACHIEVEMENT:

As indicated earlier, several factors have been highlighted by experts like Clegg (2007) and Ekine, (2013) that influence the fact that girls are participating less and show less motivation to take part in science education. Some of the reasons are extrinsic in nature which is related to differences in ways boys and girls learn and are treated in the classrooms and some sociocultural beliefs that favour males in the classrooms. In addition are the content of science education reflected in gender-biased curricula, textbooks, which are not related to women's and girls' concerns and interests(Elgar,2004; Whiteley,1996).. The attitude of teachers, parents, class mates as well as the level of confidence of girls in their science skills are determining the often observed gender gap in science education.

It therefore becomes imperative that to achieve gender parity in science and technology education (STE), it is important not only to motivate the girls themselves but also to address the surrounding socio-cultural and economic factors as well in the classroom as practiced by the teachers. Education of the girl-child is widely acknowledged as being a single and most

powerful vehicle of self-advancement and fulfillment of developmental outcomes for present and future generations of children. Girl's education is an investment. A research in Malawi, that serves as a way to achieve education for all children (Maluwa-Banda & Kholowa, 2002) attempted to address the many challenges the girl-child faces, introduced a gender sensitive training for teachers. This has also being supported by UNESCO who in 2006 developed a training manual on gender sensitivity to equip teachers to face the challenge of gender discrimination in science classes. In addition, the use of stories and games which is the main emphasis in this study has been well documented in teaching but this is limited to language development. Hence,the need for this study in science.

STORY-TELLING AND LEARNING

Story-telling is one of the most powerful techniques we have as humans to communicate and motivate. Stories are widely used in language and arts classes but never or hardly used in science classes in Nigeria, even though story telling is one of our traditional practices in Africa. Oral story-telling is a known way of passing on historical facts and culture to the younger generations. According to research on brain and friction novels, there is a connection between the cognitive development and the emotional attachment and understanding of the concept. In story-telling not only are the language processing parts in our brain activated, all other areas in our brain that we would use when experiencing the events of the story are too.

Research suggests that stories trigger responses in the brain in ways that simple lecturing may not: thus story-telling activates the brain beyond mere word recognition as it stimulates the brains motor cortex (Jordan-Young, 2010). It is an intervention that has a positive effect on girls as they are said to be verbal learners and it has the ability to effectively draw on local materials and concepts in science instruction (Ekine , 2013) . It is among the easiest interventions that can be introduced in science classes by teachers. Before the wide spread of new technology, narration was the only way to transfer heritage, customs, traditions, beliefs, and history from generation to generation.

Various researchers that had worked on story-telling have found out that stories direct the listeners' emotions toward its content, they are interesting and can present ways to think and act and they do create a favorable environment for learning, and reduces students' tensions and improves students' memory for what they learn especially in understanding mathematics concepts which is a basic subject to doing science.(Rajal, 2012)

Use of Games and teaching of Science

Games are a regular part of students' lives, no matter what their grade level. Students or pupils today play games throughout the day

on their computers, the Internet, and their cell phones especially at homes but count it as an aberration to play games in the classrooms. Robert(2010) in his study asserted that some teachers use games as a part of their instructional repertoire, most teachers do not, and those who do include them may not be using them to their full potential. He found out that the overall effect of using games in the classroom was strong in the studies he conducted although not all studies demonstrated uniform results. Some demonstrated much greater effects than the 20 percentile point gain, while others demonstrated smaller effects, and some demonstrated no effects or even negative ones.

Teacher choice of game in teaching primary science in schools is very rare in Nigeria according to Aina, (2013). Iit is a new innovation employed to enhance teaching and learning of difficult concept in science at the elementary level. These aspects of study had not been implemented into the primary school curriculum. Hence the teachers had not known its significance and many researchers have not been able to document this effect especially at this level of education. Science as a subject has continually recorded a low participation among female pupils and students(Kelly Roberts,2014) and introducing games into the classroom has been viewed as one of the innovative ways of enhancing the interest of girls at this early age because pupils have different learning styles, it's important to incorporate multiple teaching techniques into the classroom experience. This study therefore examined teachers' perception on the use of games among many other innovative methods in primary science teaching. Although a number of studies have been done on issues related to gender as well as the teaching and learning of science, little or nothing is known to have been done on the gender sensitive training that emphases use of stories and games to enhance teaching, learning and understanding of science in primary schools in Nigeria, thus a study of this nature is needful. Therefore, this study investigated the effects of gender sensitive training and the use of stories and games in the classroom in order to reach more girls. The impact of this on the teachers' perception on the use of the two methods were thus measured .

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RESEARCH QUESTIONS:

For the purpose of the study five research questions were raised as follows:

1: What is the perception of teachers on gender sensitivity in the classroom for science before and after training?

2: Is there a difference on the perception of teachers on use of story to teach science before and after the training?

3: Will there be any significant difference on the perception of teachers on use of games to teach science before and after the training?

4: Does gender have any impact on teachers' perceptions of the use of

games or story in science classes?

5. Does the years of teaching (experience) have influence on teachers' perception of the use of stories and games in science?

METHOD

A two-day training which included the use of gender sensitive methods like stories and games was organized for pre-service science teachers from the Tai Solarin University of Education. Ijebu ode and in-service science teachers from three primary and post-primary schools in Ijebu – Ode . 145 persons were trained comprising 102 teachers and 43 non-teachers (parents, ministry officials, and administrative staff), using an adapted training manual from UNESCO on gender sensitivity including the use of games and stories. The module included sessions on gender issues as it occurs in the classroom, story writing and games playing on science concepts and scientists by all participants. There were six sessions of training with each having an activity that is science-based. Only 99 teachers filled their questionnaires adequately for evaluation after the training so the other questionnaires were discarded. A structured questionnaire of 24 items was administered as a pre- test, post -test consisting of two sections. Section A was based on the demographic data of the teachers and section B consisted of items indicating their understanding of gender issues in the classrooms, the use of games and stories in science. A 4 – way likert scale was used to indicate their perception. Data collected were analyzed.

RESULTS AND DISCUSSIONS

Table 1: Distribution of the Teachers by gender

Teachers' Gender	Frequency	%
Male Teachers	38	38.4
Female Teachers	59	59.6
No Indication	02	2.0
Total	99	100

Table 1 showed that more female teachers (60%) participated in this study than male (38%), though two teachers (2%) failed to indicate their gender. This might be as a result of the fact that females are more as teachers in pre-school and primary schools than male teachers because females are more tender with children and male teachers do not find that level challenging. Figure 1 presents this information in a pie chart form.

Table 2 shows that of all the teachers involved in the study, a majority (66%) have first degree or its equivalent, those with Masters in Technology were 15%, 9% had Masters in Education and 3% have Doctorate Degree. Only 7% of them did not supply their educational qualification. Figure 2 presents this in a pie chart.

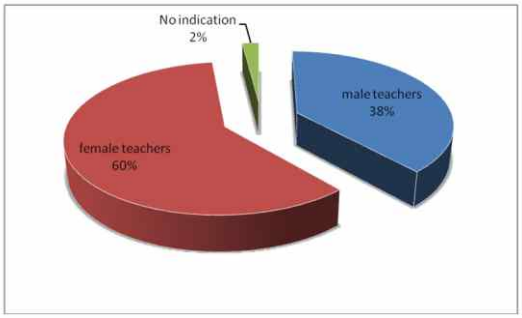

Fig.1: Distribution of Teachers by Gender

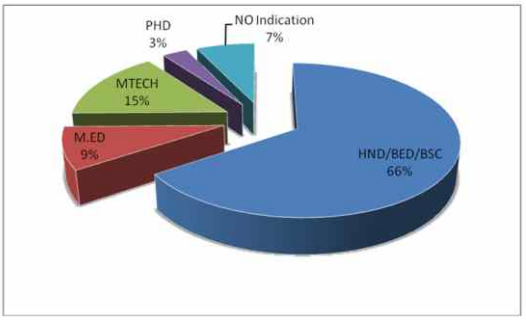

Fig.2: Distribution of Teachers by their Qualification

Table 2: Distribution of Teachers by Educational Qualification

Teachers' Qualification	Number	%
HND/B.ED/B.SC	65	65.7
M.ED	09	9.1
M.TECH	15	15.2
Ph.D	03	3.0
NO INDICATION	07	7.1
TOTAL	99	100.0

Table 3: Distribution of Teachers by Teaching Experience

Years of Teaching Experience	Freq.	%
Less than 10 years	28	28.3
11 to 20 years	11	11.1
21 to 30 years	08	8.1
No Indication	52	52.5
Total	99	100.0

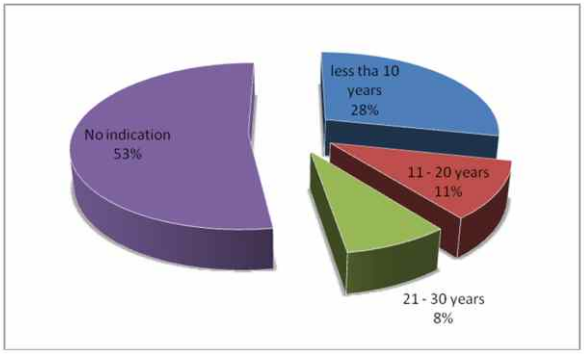

Fig.3: Distribution of teachers by years of teaching experience.

Table 3 shows that a large proportion of the teachers failed to indicate the cohort of their teaching experience (53%) though, 28% have less than 10 years of teaching experience, 11% have between 11 to 20 years, 8% have between 21 to 30 years of teaching experience. Figure 3 depicts the information in a pie chart.

RESEARCH FINDINGS

Research question 1: Perceptions of teachers on gender sensitivity for science before and after the training.

Table 4 revealed the perception about gender sensitivity of the teachers before and after the training programme. It was revealed that there is a significant difference between the

teachers' perceptions on gender issues before and after the training that can affect the performance of pupils in their classes. ($t = 4.89$; $df = 92$; $p<0.05$). The mean scores show that the teachers perception on gender issues as it occurs within their classes (21.24) was higher than the pre- test score (18.99). This implies that the teachers' perception about their sensitivity to girls' issues in the science class was more positive and the awareness increased.

Research question 2: What is the perception of teachers on use of story to teach science before and after the training?

Table 5 reveals the perception about using story to teach science of the participated teachers before and after the training programme. The result showed a significant difference between the teachers' perceptions about use of story to teach science before and after the training ($t = 3.55$; $df = 92$; $p<0.05$). The mean scores show that the teachers have higher post-perception on use of story to teach science (30.29) than that of pre-perception (27.72). The training had a positive effect on their perception of the effect of stories to teach science.

Research question 3: What is the perception of teachers on use of games to teach science?

Table 6 revealed the perception about using game to teach science by the participated teachers before and after the training. It was revealed that there is a significant difference between the teachers' perceptions about the use of game to teach science before and after the training ($t = 4.13$; $df = 92$; $p<0.05$). The mean scores show that the teachers' perception on use of game to teach science changed with a higher mean score (20.57) than that of pre perception (18.44). This implies that the teachers agreed after the training that games can actually be used to teach science.

Table 4: Paired samples t-test of perception about gender sensitivity before and after training.

Variables	N	Mean	Std.D	t	df	Sig.	Remark
PERCEPTION ABOUT SCIENCE PEDAGOGY							
Pre Perception	93	18.99	3.07				
				-4.89	92	.000	significant
Post-perception	93	21.24	3.05				

Table 5: Paired samples t-test of perception about use of story to teach science before and after intervention

Variables	N	Mean	Std.D	t	df	Sig.	Remark
PERCEPTION ABOUT USE OF STOREY TO TEACH SCIENCE	93	27.72	5.10				
Pre Perception				-3.55	92	.001	significant
	93	30.29	3.55				
Post-perception							

Table 6: Paired samples t-test of perception about use of games to teach science before and after training.

Variables	N	Mean	Std.D	t	df	Sig.	Remark
PERCEPTION ABOUT USE OF GAME TO TEACH SCIENCE							
Pre-Perception	93	18.44	3.95	-4.129	92	.000	Significant
Post-perception	93	20.57	2.19				

Table 7: Paired samples t-test of male and female science teachers on their perceptions

Variables	N	Mean	Std.D	t	df	Sig.	Remark
Post-perceptions on gender sensitivity							
Male teachers	38	20.82	3.36	-.804	95	.424	Not Significant
Female Teachers	59	21.34	2.79				
Post-Perception on Use of Story							
Male Teachers	38	30.58	3.65	.512	95	.610	Not Significant
Female Teachers	59	30.20	3.45				
Post-Perception on Use of Game							
female Teachers	38	20.58	2.47	.042	95	.967	Not Significant
	59	20.56	2.11				

Research question 4: Is there any impact of gender on teachers' perceptions?

Table 7 showed that there is no significant difference between male and female teachers in their post-perceptions in gender sensitivity ($t = -0.80$; $df = 95$; $p>0.05$); ; post-perception on the use of story to teach science ($t = 0.51$; $df = 95$; $p>0.05$); post-perception on the use of game to teach science ($t = 0.04$; $df = 95$; $p>0.05$) and post-perceptions on ability of girls to learn science ($t = -0.24$; $df = 95$; $p>0.05$). This implies that both male and female teachers have the same view about gender issues in the classroom and the use of stories or games in science teaching. It is worthy of note that gender does not have any significant effect on what they think which further corroborated earlier research work that the classroom treatment that girls receive is as a result of some subtle socio cultural factors that have been inter woven into the society.

Research question 5: Do the years of teaching (experience) have impact on teachers' perceptions use of stories and games?

Table 8 reveals that there is a significant difference among teachers with various levels of teaching experience in their post-perceptions about teaching science ($F_{(2, 95)} = 5.47$; $p<0.05$) with teachers that had experience between 11 to 20 years having the highest mean score; also in their post-perceptions on the use of story to teach

Table 8: Analysis of Variance on teachers perceptions by teaching experience

Variables	N	Mean	Std.D	F.	dfs	Sig.	Remark
Post-Perception on Science Teaching							
Less than 10 years	28	12.71	.47				
[illegible]	11	13.00	.00	5.469	2, 95	.002	Significant
[illegible]	8	12.13	.99				
Post-Perception on Use of Story							
Less than 10 years	28	29.07	2.34				Significant
11 – 20 years	11	32.27	3.44	2.838	2, 95	.042	
21 – 30 years	8	29.38	3.54				
Post Perception on Use of Game							
Less than 10 years	28	19.79	1.37				Significant
11 – 20 years	11	21.64	1.96	3.986	2, 95	.010	
21 – 30 years	8	19.13	3.04				

science ($F_{(2, 95)} = 2.84$; $p<0.05$) with teachers that had experience between 11 to 20 years having the highest mean score and again in their post- perceptions on the use of games to teach science ($F_{(2, 95)} = 3.99$; $p<0.05$) again with teachers that had experienced between 11 to 20 years having the highest mean score.

Generally, it can be inferred that the years of teaching (experience) influenced the teachers post perceptions on teaching of science, use of story and use of game to teach science. Those teachers that have between 11 to 20 years of teaching experience have better perceptions.

CONCLUSION

Closing the gender gap in science is of critical importance for all countries and Nigeria in particular because failure to attempt or do so means the loss of vast human resources that would contribute to national development. Therefore; incorporating stories into science classes could be a subtle and less costly way of increasing the participation of girls as revealed in this study. Gender sensitive training should be done on a regular basis for science teachers especially at the primary school level with emphasis on the use of games and stories that have been found out to be girl friendly. Science teaching at the basic and post-basic level needs to engage all learners irrespective of gender so as to harness the potential of all and break the barrier of gender inequality as it currently exists.

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