VULNERABLE PUPILS' SOFT SKILLS RELATED SCIENTIFIC ATTITUDE IN SOUTHWESTERN NIGERIA

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ABSTRACT

The education given to vulnerable children must be functional enough to bring them out of the vulnerability status by ensure their ability to gain lucrative job that can give financial capacity. In today's world, this type of education must leverage Basic Science and Technology (BST) to impact holistic development. Besides, cognitive development in BST, behavioural dimensions of the pupils such as attitude of science and appropriate soft skills are other indicators of the extent the pupils will engage and be successful in sciencing in the future. In particular, soft skills are required to complement the developed cognitive skills for functioning in this twenty-first century. Efforts in Nigeria have been todays giving Basic Education to the vulnerable children. Not much have been done about the behavioural dimension of such education, most especially, the orphans and those with learning disabilities. This study assessed two soft skills related to scientific attitude, that is, integrity and team spirit. A descriptive survey research design was employed, and a multi-stage sampling procedure was used to select 50 orphans and 45 pupils with a mild learning disability in southwestern Nigeria. The data collected were analysed using frequency count, percentages, mean and t-test. The findings indicated that integrity and team spirit are below average. In addition, these soft skills were not significantly different based on gender and the type of vulnerability. It was concluded that there is low integrity and team spirit among the vulnerable. Suitable interventions were also recommended to improve the soft skills.

Keywords: Vulnerable children; Soft skills; Scientific attitude; Integrity and team spirit; Southwestern Nigeria.

INTRODUCTION

The primary purpose of education is to initiate the younger ones into the society so as to acquire the acceptable social behaviour and also to empower the younger ones so as to be self-sustained and contribute their quotas into the society. Any education that is unable to provide these two functions for the recipients is due for review. This is the reason that the current Basic Education should be frequently assessed to ensure the recipients, most especially the vulnerable children, are well initiated into the society and the foundation of productive life is laid in them. The vulnerable children need the economic skills more than other children because they are expected to be self-independent early in life. However, in today's world, for Basic Education to serve this purpose, most especially, to impact the economic skills into the pupils; Basic Science and Technology must be leveraged. The pupils (most importantly the vulnerable children) must acquire appropriate and adequate scientific knowledge, skills and attitude. But the question is, with the way Basic Science and Technology is being taught at primary school

level, what amount of behavioural skills, such as scientific attitude and the related soft skills, can the pupils acquired?

Science education at the primary school level has many goals, usually framed by the social and cultural context of society, but one that is a consistent goal across different social and cultural contexts is the presentation of scientific concepts to pupils holistically (Sandoval, 2005; Appleton, 2007). In addition, teaching science's product, process, and attitude is always emphasised at the primary school level as the foundation for the learners. While the product of science includes laws, principles, and theories, the process of science is observation, measuring, and hypothesising to mention a few. The attitude of science includes intellectual honesty, accuracy and precision, suspended judgment, and open-mindedness, to mention a few. Science consists of fact-finding, objectively verifying tentative hypotheses, and provisional formulation of rational concepts (Rutjens, et al., 2018). However, within the science enterprise, attitudes of the mind guide the practitioners, which should also be developed among the developing scientists who are presently pupils in primary school, including those with special educational needs.

Social justice includes meeting the educational needs of learners with special needs and vulnerable children at all grade levels (McGinnis, 2013). Recently, efforts in science education for special needs learners have been directed toward bridging the underrepresentation gap (Villanueva & Hand, 2011; Villanueva et al., 2012). Beyond bridging the underrepresentation gap, there is evidence of an achievement gap linked to special needs learners' difficulty in reading, mathematics, and writing (Villanueva et al., 2012). Most efforts are directed toward teaching strategies and activities that can improve the product of science related to the cognitive domain of learners with special needs. There appears to be little effort directed toward the behavioural dimensions of science and science attitude in particular among vulnerable children. Beyond the conventional goals of Basic Science teaching, 21st-century skills like critical thinking, collaboration, communication, innovation, self-direction, global connections, local connections, and the use of technology are equally important and mandatory for the learners to enable them to fit the societal demands (National Research Council, 2010). There is a need to link science education to economic globalization (Hodson, 2003) because the changing world demands that entrepreneurial and economic skills are essential in science education, along with the traditional goals of developing scientific literacy in learners (Adeyemo, 2009; Turiman, 2012). This comes with soft skills such as emotional intelligence, respect for others, team spirit, open-mindedness, and honesty. The link between soft skills and science attitude has been established in the past, and they can be considered two sides of the same coin (Susilawati et al., 2019). Susilawati et al. (2019) identified critical thinking, teamwork, creativity and innovation, communication, problem-solving, curiosity, rigor, integrity, analysis, research and inquiry, information literacy, and objectivity as the twelve major soft skills in science. Among the soft skills identified, teamwork, creativity and innovation, curiosity, rigor, and integrity are directly related to attitude of science. The two soft skills directly linked to an attitude of science that this study intends to assess among vulnerable children are integrity and teamwork.

Concerns over the morals of pupils in primary school have made many researchers give attention to assessing and improving moral values among pupils in Nigeria (Aina, 2023). Unfortunately, the findings of the studies related to the assessment of moral value indicate that the status of moral decadence is high (Aina, 2023). The evidence of this observation involves various incidents of corruption and malpractice involving pupils (Glendinning, 2022). Studies that have assessed pupils' integrity have excluded the vulnerable pupils in Nigeria and globally.

Studies on cooperation and teamwork among pupils have focused on how teamwork improves learners' achievement in various school subjects in a cooperative learning environment (Salvin, 1987; Anidi et al., 2022). Beyond this, there is a need to examine the team spirit of pupils to determine the cognitive, social, emotional, spiritual, and physical dimensions of the team spirit of pupils (Sewell, 2006). A handful of studies focus on understanding the team spirit of primary school non-vulnerable and vulnerable pupils outside Nigeria with little emphasis on achievement (Kutnick & Blatchford, 2014; Baines et al., 2022). This situation support execution of this study to assess the team spirit of vulnerable children to understand the areas of need.

There are many studies on soft skills in higher education than primary school (Ismail et al., 2017; Maren, 2020; Dogara et al.,2020). Since it is highly demanded in the workplace in the twenty-first century, developing such skills should start early. However, efforts like that of Ahmad & Md-Ali (2019) used mathematics classroom instruction to promote the soft skills of primary school pupils in Malaysia. There are no adequate reports assessing the soft skills of primary school pupils in Nigeria. Durowoju & Onuka's (2023) investigation of the best practices in assessing students' soft skills and teachers' personal experiences in assessing students' soft skills remains the closest study related to soft skills in primary school relying on Google Scholar. More importantly, no study focuses directly on the soft skills of vulnerable children, especially at the primary school level in Nigeria. Primary education, most importantly the lower primary level, is characterised with rapid development of human in knowledge, skills and personality (Balasundaram and Avulakunta, 2023) which informed the identification of this level as the formative years.

Vulnerable children in this study are conceived as orphans and those with special needs. Outside Nigeria, in a qualitative study, Zainal-Abdin et al. (2019) explored the life story of a Malaysian young adult who came from a very vulnerable background but thrived because he developed soft skills. Santilli et al. (2019) averred that social inclusion is possible if the soft skills of the vulnerable are developed. If Nigeria would attain her social inclusion goals, the state of the soft skills of the vulnerable must be determined. Unfortunately, Kelly (2019) argued that despite economic growth and the transition to democracy, Nigeria has not attained her social inclusion goals because the vulnerable, among others, are not participating fully as expected in the national development process. To bridge this gap, this present study intends to assess the soft skills of the vulnerable pupils in lower primary schools. This is done to determine the extent to which the present content and pedagogy adopted to educate these pupils impact holistic development that include the science related soft skills.

Any nation's development level is doubtlessly determined by science and technology. As a result, if the vulnerable participate in science, they will be able to bridge the gap in the STEM pipeline, and, at the same time, social inclusion will be a possibility. Therefore, this current study considered soft skills linked with scientific attitudes of intellectual honesty and teamwork. Therefore, of all the soft skills indicators identified in the literature, teamwork and integrity are considered in this study.

In addition to assessing the two soft skills, this study determined the influence of gender and the vulnerability category on the pupils' soft skills. The relationship between integrity and gender of non-vulnerable preschoolers in an intervention study by Betawi et al. (2022), using moral stories as the treatment and gender as the moderator variable. Betawi et al. found that gender has no significant effect on all the dimensions of integrity considered in their study. On the other hand, in terms of delinquent behaviours, boys are always reported to be more disposed

than girls (Jager, 1998). Regarding the influence of gender on team spirit, Jager (1998) reported that gender predicted peer-rated helping behaviour and girls demonstrated the behaviour more than boys. In another study, Cardenas et al. (2014) found robust evidence of a difference in cooperation between boys and girls in Colombia and Sweden in favor of boys. This present study will examine if there is a gender difference in the team spirit of vulnerable children.

From the two categories of vulnerable children, this study also intends to determine if there are differences in the soft skills of the two categories. Nabor et al. (1999) found a difference in the level of cooperation of children with special needs and those without when engaging in complex activities in playground settings. This present study has children with special needs and those without who are orphans. The study intends to determine the influence of the two categories on their team spirit and integrity.

THEORETICAL BACKGROUND

Fun-rigor Theory of Child Development (F-R Theory), which was developed by Salami, Ishola Akindele in 2018 anchored the study. The theory submits that injection of some developmentally appropriate real-life rigors to the day-to-day fun activities of children will bring about the development of economic skills (determination-for-success, invention, endurance, persistence, self-dependent) and soft skills (responsibility, flexibility, team-spirit, integrity and courtesy) in the children hence, assure of success. The position of F-R theory is that the development of economic and soft skills of pupils alongside other developmental domains, is paramount to their successful living in the future. The theory advocated that children education should not be through enjoyment or fun alone but with some developmentally appropriate challenging activities in order to give all round development that is needed for survival in this age. In this study, the focus was on the level of soft skills exposed to the OVC, which will eventually pave way for intervention on the education given to the children for future independence and survival.

RESEARCH QUESTIONS

1. What is the level of team spirit of the vulnerable primary school pupils?
2. What is the level of integrity of vulnerable primary school pupils?
3. Is there a significant influence of gender on:
   a. Team spirit of vulnerable primary school pupils?
   b. Integrity of vulnerable primary school pupils?
4. Is there a significant influence of vulnerable pupils' category on their:
   a. Team spirit
   b. Integrity

METHODOLOGY

This report is part of a larger study in which five major soft skills were to be enhanced in a quasi-experimental study. Descriptive survey design was adopted to measure responsibility, flexibility, team spirit, integrity, and courtesy of orphans and children with mild disability at pre-test level of the larger study. The descriptive design was adopted at this level in order to measure the level of acquisition of the skills, some factors that might have affected the acquisition of the skills and able to describe these succinctly. Of the five soft skills, team spirit and integrity were purposively selected because they are associated with teamwork and intellectual honesty, which are crucial to attitude to science, the concerns of this present paper.

Sample

Three states (Osun, Oyo, and Ogun) were randomly selected in southwestern Nigeria. In each state, two primary schools - one for orphans and one for children with special educational needs

were selected. For the selection process, the school's ownership (public or private) was not considered, instead, the willingness of the school to participate in the study. In addition, none of the states practice inclusive education for children with mild learning disability, and as a result, the special schools selected were segregated primary schools. Primary II pupils in the selected schools were purposively selected because of their age being with the early childhood stage and having spent a year in a formal school setting. The consent of the parents and guardians of all the selected pupils were sought. The study sample comprised 50 orphans (52.6%) and 45 pupils (47.4%) with a mild learning disability. Also, 50.5% of the respondents are males and 49.5% are females. 86.3% were Yoruba, 2.1% Hausa, and 9.5% were Igbo and 1.1% Tiv.

Instrument for Data Collection
Primary Pupils Soft Skills Observation Schedule (PpSSOS, r = 0.85), a self-developed and validated rubric was used for the data collection. The instrument has two sections. Section A collected demographic data on state, ethnicity, and gender. Section B contains five subsections wherein each subsection contains five items measuring the five soft skills.

In order to have the pupils exhibiting the skills in their natural setting, different hands-on play activities were organised by providing materials and the pupils were asked to engage in it. The classroom teachers of the pupils were co-opted in addition to the Research Assistants (RAs) to be the raters. The teachers were trained on how to administer the rubric on each pupil. The teachers, with the support of the Research Assistants rated each of the pupil's soft skills which lasted two weeks.

RESULT

Table 1: Level of Team Spirit among the Vulnerable Pupils

Items	N	Mean	Std.D	Remark
Enjoys doing activities with others	95	1.779	.622	Fair
Show likeness to other team members	95	1.874	.551	Fair
Does not get angry or moody when corrected	95	1.726	.660	Fair
Easily take up leading roles in activities	95	1.705	.650	Fair
Does not insist on being the leader always	95	1.621	.687	Fair
Sub-weighted average		1.741		
Threshold		2.50		

Table 1 reveals all the mean scores of the pupils in the five items related to team spirit. The table shows that the pupils fairly enjoy doing activities with other (mean = 1.78), fairly showing likeness to other team members (mean = 1.87), not getting angry or moody when corrected is fair (mean = 1.73), easily taking up leading roles in activities is rated fair (mean = 1.71) and that they do not always insist on having leadership roles is also rated fair (mean = 1.62). Against the threshold of 2.5, the student's response indicates that the team spirit of the pupils is low (Weighted average = 1.74) and indicating a team spirit that requires improvement.

Table 2: Level of Integrity of the Vulnerable Pupils

Items	N	Mean	Std.D	Remark
Being honest when mistake has been made	95	1.642	.683	Fair
Always tells the truth even when it could lead to being punished	95	1.895	2.166	Fair
Does things the right way even when no one is watching	95	1.600	.659	Fair
Insist on perfection even in a group work	95	1.526	.616	Fair
Like to keep promise	95	1.684	.606	Fair
Sub-weighted average		1.669		
Threshold		2.50		

From Table 2, many pupils are fairly honest when a mistake has been made (mean = 1.64); they fairly do things right when no one is watching (mean = 1.60), their act of insisting on perfection in group work is fair (mean = 1.52), and keeping promises is also fair (mean = 1.68). The only item that it means is close to the benchmark 2.5 is the one on telling the truth even when it could lead to being punished (1.90), but this is still low. The weighted average indicates (1.67) that pupils' integrity is below average.

Table 3: Independent t-test of Team Spirit according to Gender

Gender	N	Mean	t	df	Sig.	Remark
Male	48	9.00	1.24	93	0.218	Not sig
Female	47	8.40				

The table above shows that the team spirit mean score of females (8.40) is lower than that of males (9.00), but the observed difference is not significant (t=1.24; df=93; p>0.05). This implies no significant influence of gender on the vulnerable pupils' level of team spirit.

Table 4: Independent t-test of Integrity according to Gender

Gender	N	Mean	t	df	Sig.	Remark
Male	48	8.08	0.776	93	0.44	Not sig
Female	47	8.61				

 The table above shows that the integrity mean score of females (8.61) is higher than that of males (8.08), but the observed difference is not significant (t=0.77; df=93; p>0.05). This implies that there is no significant influence of gender on vulnerable pupils in their level of integrity.

Table 5: Independent t-test of Team Spirit according to Vulnerable Pupils' category

Gender	N	Mean	t	Df	Sig	Remark
Orphan	50	7.78	1.762	93	0.711	Insignificant
Special need	45	8.97				

Table 5 shows that the team spirit mean score of orphans (7.78) is lower than that of children with special needs (8.97), but the observed difference is not significant (t=1.76; df=93; p>0.05). This again, implies that there is no significant difference between orphans and children with special needs in their level of team spirit.

Table 6 Independent t-test of Integrity according to Vulnerable Pupils' Category

Gender	N	Mean	t	df	Sig	Remark
Orphan	50	8.62	0.372	93	0.711	Not sig
Special need	45	8.80				

 Table 6 shows that the integrity mean score of orphans (8.62) is higher than that of children with special needs (8.80), but the observed difference is not significant (t=0.37; df=93; p>0.05). This implies that there is no significant difference between orphans and pupils with special needs in their level of integrity.

DISCUSSION

The result of the study indicated that the orphan and pupils with special educational needs in the lower primary classes had low team spirit and integrity. Intellectual honesty is a scientific attitude related to integrity soft skill, while teamwork as one of the scientific attitudes is related to team spirit soft skills. Deductively, this provides evidence that beyond the achievement and enrolment gaps in science education among the vulnerable, there is also a gap in terms of the development of attitude to science going by the soft skills related to the scientific attitude. This finding might be as a result of over concentration of the school activities on cognitive development to the detriment of other learning domains and soft skills (Salami, 2016).

From the result, gender has no significant influence on the team spirit and integrity of the orphan and vulnerable pupils in lower primary classes. This also applies to the category of vulnerable children, which did not influence the team spirit and integrity. This might be as a result of the quality of education exposed to the pupils, be it male or female; orphan or children with special educational needs, which lack those activities targeting the development of soft skills. The insignificance notwithstanding, it is important to highlight the higher mean score of males in team spirit. It is more convenient for vulnerable male children to work as a team than their female counterparts. This finding differs from that of the study of Cardenas et al. (2014), which revealed a gender difference in the cooperation of non-vulnerable children in favour of boys. The main difference between this present study and that of Cardenas et al. (2014) which reported a significant difference might have been accounted for by the type of soft skills measured.

On the contrary, for integrity, orphan and vulnerable female children had a higher integrity than males. Though the difference is shown not to be significant. This finding aligns with that of Betawi et al. (2022), who found that gender had no significant effect on all the dimensions of integrity.

Orphan children also showed they could work as a team more compared to children with special needs. However, the difference in team spirit is not significant according to the vulnerability.

CONCLUSION

The team spirit and integrity of orphan and vulnerable children are below average, and neither is significantly influenced by the gender of the pupils and their class of vulnerability. This underscore the provision of intervention which can improve the acquisition of these skills.

ACKNOWLEDGEMENT

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