

INFLUENCE OF SCHOOL OWNERSHIP AND TWO MODELS OF PROBLEM BASED LEARNING APPROACHES ON STUDENTS' PSYCHOMOTOR SKILLS ACQUISITION IN DART MANIPULATION

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ABSTRACT

This study investigated the influence of school ownership and two models of problem based learning (PBL) approaches on students psychomotor skills acquisition in dart manipulation. Two research questions and null hypotheses guided the study. The design used was quasi-experimental design. Specifically, the pretest-posttest non-equivalent group design was used. The population for the study was 426 NCE III Home-Economics students from public and private Colleges of Education in North Central States (NCS) of Nigeria. The sample size was 208 Home Economics students comprising of 151 females and 57 males. The instruments for data collection were Dart manipulation

psycho-productive process skill test (DMPPST), a rating scale and two instructional PBL lesson plans (Fixed and floating). The reliability of DMPPST was determined using Kuder-Richardson formula 20 (K-R 20), because the items were dichotomously scored. An internal consistency reliability of 0.76 estimate was obtained. The two instructional programmes PBL lesson plans (fixed and floating) were also validated and used for the different treatment groups. The treatment group 'A' (two schools: private and public) learned the process skill in dart manipulation using the fixed facilitator approach, while the treatment group 'B' (two schools: private and public) used the floating facilitator approach. Data obtained were analysed descriptively and inferentially. Mean was used to answer the research questions, while all the null hypotheses were tested at .05 level of significance using analysis of covariance (ANCOVA) statistics. Students (from private school) taught Dart Manipulation (DM) using Floating Facilitator (PBL) model had higher mean process skills achievement scores MPSAS (33.55 ± 4.88) than their counterparts (public school) taught using fixed facilitator PBL (31.8 ± 4.89). There was statistically significant main effect ($p < 0.5$) for learning models on MPSAS of students taught DM. Students (public schools) taught DM using floating facilitator PBL approach had higher mean psycho productive process skill achievement scores PPPSA (34.33 ± 5.02) than their counterparts (private school) taught using fixed facilitator PBL (33.16 ± 4.24). The result revealed that there was no statistically significant main effect ($p > 0.05$) of school ownership on student's skills acquisition in Dart Manipulation. The result also revealed that there was no statistical significant main effect ($p > 0.05$) of school ownership on students PPPSA in DM. Based on the findings, the use of floating facilitator model was recommended for teaching dart manipulation skill acquisition in curriculum for clothing and textile teachers in private or public higher Colleges of Education in NCS.

Key Words: psychomotor skills, fixed and floating facilitator, problem based learning, school ownership

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1. INTRODUCTION

A school is an educational institution designed to provide learning spaces and learning environments for the teaching of students under the direction of teachers. The great public benefits of education have historically prompted governments to assume the primary role in managing and funding schools. Recently, a growing interest in improving school quality, student outcomes, and a quest for greater school choice for parents and students, for more creativity and innovation in the schools, themselves, has challenged the notion of government's primacy in education (oecd, 2006; brewer and hentschke, 2009). This trend, emerging in a number of countries, is based on the belief that the public interest in education can be better served by also involving private entities, including parents, non-governmental organizations and enterprises, in addition to government agencies, in managing and funding schools.

This study focuses on influence of school ownership (public and private) on students (male and female) skill acquisitions in dart manipulation on problem based learning approach in clothing and Textile Education. Stratification may lead to unequal educational opportunities

and outcomes, and can undermine social cohesion. If certain types of schools have more resources or a better learning environment, students who attend these types of schools are more likely to perform better. Conversely, those students who attend schools with fewer resources for practicals and disruptive environments tend to perform poorly, which could ultimately limit their prospects in life (Woessmann et al., 2006; Wrinkle et al., 2009; Amanda & Marrazzo, 2010). In addition, as learning environments and gender play important roles not only in students' academic performance but also in their socialization in a broader sense, school ownership that are highly stratified along socio-economic lines could inadvertently undermine social cohesion. socio-economic stratification, as well as how students' educational experiences differ depending on whether they attend publicly or privately managed schools (OECD, 2006).

Privately managed schools may have the authority to hire and compensate teachers and staff, and thus can select better-prepared teachers and introduce incentives for performance. Privately managed schools may also have more discretion on curricula and instructional methods, and so can adapt them to the interests and abilities of their students. The need to attract students means that privately managed schools must be more sensitive to parents' demands concerning curricula, teaching methods, facilities and discipline, and more responsive to students' needs (Ammermuller, 2005; Brewer and GHentschke, 2009); Böhlmark and Lindahl, 2007); Bifulco, Ladd and Ross, 2000; Couch Shugart and Williams, 1993); Epple, Figlio and Romano, 2004). Although public funding may create opportunities for those who could not afford tuition fee (Woessmann, 2009; Wrinkle, R., et al, 1999; Amanda Marrazzo, 2010), it may reduce the pressure on schools to be accountable for student outcomes, since parents would be less likely to exert this pressure, given that they do not directly bear the cost of education in these schools.

The evidence on the impact of public and private involvement on performance is mixed. cross-country studies conducted by woessmann (2006 and 2009) concluded that countries that combine private management and public funding tend to have better overall academic performance. Studies in chile (lara, mizala and repetto, 2009), the czech republic (filer and münchen, 2003), sweden (sandström and bergström, 2005), the united Kingdom (green, et al., 2011) and the united states (couch, shugart and williams, 1993; Peterson, et al., 2003) showed that higher private school enrolments are related to better performance based on cross-sectional or longitudinal data or the data before and after structural changes, but the debate on performance is far from conclusive, as other studies report little, negative or insignificant effects, and the results often depend on methodological choices. example, other studies concluded that higher private school enrolment is not significantly related to performance (wrinkle, et al. 1999; geller, sjoquist and walker, 2006; sander, 1999); a few reported only small negative effects (smith and meier, 1995), negative effects for low-income districts (maranto, milliman and scott, 2000), or that the relationship depends on the student educational outcome measured (greene and Kang, 2004). Preliminary evidence from Pisa 2009 also points to mixed results (see annex a2).

Cross-country evidence indicates that private schools can also reinforce inequities in learning outcomes. Using data from Pisa 2000 and Pirls 2001, ammermuller (2005) found that a system with a large private school sector showed greater inequality in scores, although the estimation did not distinguish between Public and private funding. however, schuetz, ursprung and woessmann (2009), using data from timss and timss-repeat, and woessmann, et al. (2009), using Pisa 2003 data comparing public to private funding, concluded that higher shares of private management and public funding were related to lower impacts of socio-economic background on performance. Studies in sweden (böhlmark and lindhal, 2007), chile (hsieh and urquiola, 2006) and new Zealand (fiske and ladd, 2000) provide evidence that public funding that does not specifically target disadvantaged students leads to greater stratification. These

findings highlight the importance of establishing targeted approaches to teaching to acquire saleable skills. Emphasis by the public nowadays according to Wayne and Miskel (2014) is on efficiency, academic achievement and acquisition of employable skills like dart manipulation

Darts are forms of lines or design element used for style production. They are formed by arrangement of lines in different directions. Darts may change in size, number and direction and are at times placed in a seam to accommodate a style that may sometimes be made invisible. This process of changing dart from one position to any other is known as dart manipulation (Igbo and Iloeje 2013). These movements which include: moving waist dart to shoulder, bust dart to neckline, waistline to under arm, bust dart to armhole, and movement of dart to form princess line produce different designs which solve figure problems. Using darts in clothing and textile education is one of the effective areas of process and psychomotor skills acquisition. in clothing and textile. Effective skill acquisition in dart manipulation concept may be in the area of cognitive, affective and psychomotor domain.

Psychomotor skills acquisition in Dart manipulation concept is one of the achievable educational domains which will lead to the production of self-reliant individuals that could go in to garment industry. For the teaching of psychomotor skills in dart manipulation to be effective, it requires a fair knowledge of drafting, combined with drawing and sketching. Specifically, Pandey (2012) advocated for problem based learning approach of teaching.

Problem-based learning (PBL) is a method of instruction that uses ill-structured problem as a context for students to acquire problem solving skills and basic knowledge (Nwadi, 2016). Problem based learning could be a perfect way of combining theory and practice effectively in dart manipulation. In addition, PBL has models or examples to copy. According to Pandey (2012), the models are (1) fixed or peer facilitator (2) Floating facilitator and (3) hybrid facilitating models. The present study is based on fixed and floating facilitator modes. These models were chosen because the processes of the application were in line with the problem-solving skills needed for effective learning of dart manipulation. In the fixed facilitator model, the students are split into groups of about 5-10. The teacher (facilitator) guides the students through their discussions of the problem. The work is done by the students in their groups and with the facilitator, guiding every step of the group activity. In the floating facilitator model, the teacher (facilitator) allows the students to work on their own, but moves around at intervals, from group to group listening to the students, probing their understanding and imparting skills in them.

Osinem and Nwaoji (2005) stated that skill is the ability of a person to perform a given task as well as a result of training and practice. In the context of this study, skill is the capability which students of clothing and textile must acquire to enable them perform a given task in dart manipulation. Skill acquisition is conceptualized as the ability to choose a trade, occupation or profession which best suit his/her economic gains and to work hard to succeed. Osinem and Nwaoji (2005) stated that skill is the ability of a person to perform a given task as well as a result of training and practice. In the context of this study, skill is the capability which students of clothing and textile must acquire to enable them perform a given task in dart manipulation. Skill acquisition is conceptualized as the ability to choose a trade, occupation or profession which best suit his/her economic gains and to

Psychomotor skill acquisition tells what the students have acquired during the process of manipulation. In order to achieve observable psychomotor skill acquisition in dart manipulation, there is need to measure their psychomotor skills by using well-constructed and validated Psycho-productive skills test. In order to improve the acquisition of psychomotor skills of learners in dart manipulation, efforts should be made at investigating the interactive effect of treatment given to students and their gender with respect to their process and

psychomotor skill acquisition in dart manipulations. From a young age, children learn to imitate and develop patterns of behaviour based on positive reinforcement, cognitive, and psychomotor development. Mcleod(2016)emphasized that sex linked characteristics are maintained as transmitted to other members of the same culture .Gender associated information is predominantly transferred to society by way of gender scheme ,or complex networks of information that are then sorted by the recipient. Many factors from policies to practices affect male and female students on psychomotor skill acquisition differently because they are located differently within our societies. Overlooking gender means being practically blind to the complete reality of students psychomotor skill acquisition in dart manipulation when Models of Problems based learning approach is adopted. To achieve observable psychomotor skill acquisition in dart manipulation, there is need to measurer psychomotor skills by using well-constructed and validated Psycho-productive skills test. In order to improve the acquisition of psychomotor skills of learners in dart manipulation, efforts should be made at investigating the interactive effect of treatment given to students and their gender with respect to their process and psychomotor skill acquisition in dart manipulation

2. PURPOSE OF THE STUDY

The general purpose of the study was to investigate the influence of school ownership and two models of problem based approaches on students' skills acquisition in dart manipulation. Specifically, the study sought to determine the:

- influence of school ownership on the mean process skills acquisition in dart manipulation using fixed and floating facilitator model.
- influence school ownership on the mean psychomotor skills acquisition of students in dart manipulation using fixed and floating facilitating model.

2.1. Research Questions

The following research questions guided the study:

- What is the influence of school ownership on the process skill acquisition scores of students in dart manipulation?
- What is the influence of school ownership on the mean psychomotor process skill scores of students in dart manipulation?

2.2. Hypotheses

H0₁: school ownership has no significant influence on the process skill acquisition of students taught dart manipulation with fixed facilitating Model and those taught with floating facilitating model.

H0₂: There is no significant interaction effect of treatments given to students and school ownership with respect to their psychomotor skill acquisition in dart manipulation

3. METHODS

The study adopted a quasi-experimental design. Specifically, a pretest-posttest non-equivalent group design was used. Quasi-experimental design was used in this study because full randomization of subjects to experimental groups was not possible. In order not to disrupt the normal class structure, intact classes were used in this study.

This study was carried out in the North central States of Nigeria. The North central state of Nigeria is made up of seven states. These include; Kogi, Benue, Nassarawa, Niger, Plateau, Kwara and FCT Abuja. All the accredited Public and private Federal and State Colleges of

Education that enroll students for Home Economics in the Nigeria Certificate in Education (NCE) Examinations were used for the study. The zones were chosen because they have reasonable number of regular Home-Economics students from both private and public schools allowed for effective comparison of process skill acquisition.

The population for the study consisted of all the 426 NCE III Home Economics students in the Private and public Colleges of Education in North central states of Nigeria in 2010-2013 academic session where Home-Economics was offered as compulsory vocational subject. The sample size was 208 Home Economic students comprising (151 public and 57 private). Purposive sampling technique was used to draw four colleges of education. Private schools chosen were City Mararaba Gurku Nasarawa state and Kinsey College of Education Ilorin, Kwara state, while public schools chosen were colleges of Education Ankpa kogi state and College of Education Oju Benue state. The four colleges were drawn because they had reasonable number of students that will allow for effective comparison of acquisition of process skills. Other colleges were dropped because the numbers of students of Home-Economics were grossly inadequate for effective comparisons. Two schools were assigned to one experimental model while the other two were assigned to another experimental group. All information about the group was obtained from the personnel department of the various colleges of education 2010-2013.

The instruments for data collection were Dart manipulation psycho-productive process skill test (DMPPST), a rating scale and two instructional problem based learning lesson plans(fixed and floating). The reliability of DMPPST was determined using Kuder–Richardson Formula 20 (K-R 20). K – R 20, because the test items were dichotomously scored. An internal consistency reliability of 0.76 estimates was obtained. At the beginning of the experiment the researcher, with the regular Clothing and textile teacher in the Colleges of Education administered the pre-test of the (DMPPST) to the treatment groups. At the end of the experiment, the DMPPST was administered to the two groups as posttest. For each of the groups data, the pre-test and post-test were recorded separately.

Mean was used to answer all the research questions. Standard deviation was used to determine the degree of deviation from the mean, while analysis of covariance (ANCOVA) was used to the test null hypotheses at '0.05' level of significance. The use of ANCOVA was to control the errors of the initial non-equivalence arising from t use of intact classes as subjects of the study. With the use of ANCOVA too, the pre-test result served as covariate of the post test results. The analysis was carried out using the statistical package for the social science (SPSS

4. RESULTS

4.1. Research Question 1

What is the influence of school ownership on the mean process skill scores of students in dart manipulation using two facilitator models?

Data for answering research question 1 are presented in Table 1

Table 1 Mean response on the influence of school ownership on process skill scores of students in dart manipulation using fixed and floating facilitating Models?

School ownership	Fixed Facilitating Model				Floating Facilitating Model			
	N	Pretest X	Posttest (X)	Mean Gain	N	Pretest (X̄)	Posttest (X̄)	Mean Gain
public	51149	16.63	31.4931.92	14.86	3367	13.61	32.52	18.91
private		15.75		16.17		13.88	32.91	19.03

Table 1 shows the dart manipulation mean pre/posttest of public and private school students for experimental groups. The students (public schools) in the fixed facilitating groups had a mean pre-test score of 16.63. Their posttest means score was 31.49. This resulted to a pre/posttest mean gain score of 14.86. The students (public) in the floating facilitating model groups has a pre-test mean score of 13.61; their posttest mean score was 32.52. This resulted to a post/pre-test mean gain of 18.91.

While the students (private school) in the fixed facilitating model groups had a pre-test mean score of 15.75. Their posttest means score was 31.92. This resulted to a pre/posttest mean gain score of 16.17. The students (private school) in floating facilitating model group had pre-test mean score of 13.88. Their posttest means score was 32.91. This resulted to a pre/posttest mean gain score of 19.03. This implies also that school ownership had no influence on the mean process skill scores of students in dart manipulation on the two models of problem based learning.

4.2. Research Question 2

What is the influence of school ownership on the mean psychomotor skill scores of students in dart manipulation using two facilitating models?

Data for answering research question 2 are presented in Table 2

Table 2 Mean response of influence of school ownership on psychomotor process skill scores of students in dart manipulation.

School Ownership	Fixed Facilitating Model				Floating facilitating Model			
	Pretest	Posttest	Mean Gain	N	Pretest	Posttest	Mean Gain	N
	(\bar{X})	(\bar{X})	(\bar{X})		(\bar{X})	(\bar{X})	(\bar{X})	
Public	25	17.24	32.76	15.52	30	15.10	34.17	19.07
Private	75	16.36	33.16	16.80	70	15.54	34.39	18.85

Data in Table 2 revealed the psychomotor pre and posttest mean score of students based on school ownership. The students (public school) in the fixed facilitating model groups had a pretest mean score of 17.24 in dart manipulation test; their posttest mean score was 32.76. This resulted to a pre/posttest mean gain score of 15.10; their post test mean score was 34.17. This resulted to a pot |pretest mean gain of 19.07. While students (private schools) in the fixed facilitating model groups had pretests mean score of 16.36 in dart manipulation test; their posttest means score was 33.16. This resulted to a pre / posttests mean gain score of 16.80. The students (private schools) in floating facilitating model group had a pretest mean score of 15.54; their posttest mean score was 34.39. This resulted to a pretest / posttest means gain score of 18.85.) This implied also that school ownership had no influence on psychomotor skills in dart manipulation using the two facilitating of problem based learning approaches.

4.3. Testing of hypotheses

HO₁: School ownership has no significant difference on the mean process skill of students taught dart manipulation with fixed and floating facilitating model.

HO₂: There is no significant interaction effect of treatment given to students and school ownership with respect to their process skills in dart manipulation.

Table3: Results in Table 3 answers Hypotheses 1-3

Table 3 ANCOVA analysis on psychomotor process skills of students taught with fixed facilitating model and those taught with floating facilitating model

Tests of Between-Subjects Effects

Source	Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	151.554 ^a	4	37.888	1.760	.138
Intercept	3365.165	1	3365.165	156.33	.000
pre test	77.285	1	77.285	3.590	.060
Treatment	97.105	1	97.105	4.511	.035
School ownership	9.076	1	9.076	.422	.517
Treatment * School ownership	5.435	1	5.435	.253	.616
Error	4197.435	195	21.525		
Corrected Total	4348.989	199			

The result in Table 3 on hypothesis one shows that there is no significant difference on school ownership. This is because F (.422) is higher than the probability level of .05. This means that there is no significant difference. The null hypotheses of no significant difference in public and private school students (school ownership) in process skill acquisition using floating model of PBL in dart manipulation therefore is upheld.

Data in Table 3 on hypothesis two also show that there is no significant interaction effect of treatment given to students and school ownership with respect to their process skills in dart manipulation. This is because F (.253) is higher than the probability level of 0.05. Thus the null hypothesis of no significant interaction effect of treatment and school ownership is upheld

5. DISCUSSION

The result of this study as shown in table 1 revealed that school ownership has no significant influence on students' process skill acquisitions. The result of this study is contrary to the findings of many studies on the influence of school ownership on students' psychomotor skill acquisition which agreed that it makes for positive change in their process skill acquisition. For example, the evidence on the impact of public and private involvement on performance is mixed. cross-country studies conducted by Woessmann (2006 and 2009) who concluded that countries that combine private management and public funding tend to have better overall academic performance. Studies in Chile (Lara,Mizala and Repetto,2009), the Czech republic (Filerand Munich, 2003), Sweden (Sandström and Bergström, 2005), the united Kingdom (green,etal.,2011) and the united states (Couch, Shugart and williams, 1993; Peterson, etal., 2003) showed that higher private school enrolments are related to better performance based on cross-sectional or longitudinal data or the data before and after structural changes, but the debate on performance is far from conclusive. As other studies report little, negative or insignificant effects, and the result soften depend on methodological choices. Other studies concluded that higher private school enrolment is not significantly related to performance (wrinkle, etal. 1999; Geller Sjoquist and Walker, 2006; sander, 1999); a few reported only small negative effects (smith and Meier, 1995), negative effects for low-income districts (Maranto, Milliman and Scott, 2000), or that the relationship depends on the student educational outcome measured (Greenand Kang ,2004). Pisa (2009), found that school ownership has significant influence on students' achievement in biology. He asserted that it was significant source of variation in overall performance of students.

Literature has shown that school ownership does not affect students in learning ability but they may respond differently to the content being presented as well as the learning environment. Consistently, research has shown that school ownership has less to do with how intelligent or competent the students are and therefore it is tendency trait displayed by all students in response to learning environment. It is therefore possible that the type of learning environment where these students were exposed to may have contributed to the difference in their process skill acquisition in dart manipulation. For the students who were exposed to problem-based learning environment, they all benefited equally. Cross-country evidence indicates that private schools can also reinforce inequities in learning outcomes. Using data from Pisa (2000) and Pirls (2001), Ammermuller (2005) found that a system with a large private school sector showed greater inequality in scores, although the estimation did not distinguish between Public and private funding. However, Schuetz, Ursprung and Woessmann (2009), using data from TIMSS and TIMSS-repeat, and Woessmann, et al. (2009), using Pisa (2003) data comparing public to private funding, concluded that higher shares of private management and public funding were related to lower impacts of socio-economic background on performance. Studies in Sweden (Böhlmark and Lindhal, 2007) and Urquiola, (2006) and New Zealand (Fiske and Ladd, 2000) provide evidence that public school that does not specifically target disadvantaged students leads to greater stratification. These schools highlight the importance of establishing targeted approaches to teaching to acquire saleable skills. Emphasis by the public nowadays according to Wayne and Miskel (2014) is on efficiency, academic achievement and acquisition of employable skills like dart manipulation.

This shows that even though it was discovered in this study that the approaches significantly influenced students' process skill acquisition in dart manipulation, it is also important to note that there was no significant difference in the influence of school ownership on both process skill acquisition in dart manipulation of students due to exposure to the two models of PBL. This could be attributed to equal opportunity which learning in a problem-based approach affords to all students. The result of this study as revealed in table 2 showed that school ownership has no influence on students' psychomotor process skill acquisition in dart manipulation, however there was slight difference in process skill acquisition. Conversely, those students who attend schools with fewer resources for practicals and disruptive environments tend to perform poorly, which could ultimately limit their prospects in life (Woessmann et al. (2006), Wrinkle et al. (2009), and Amanda Marrazzo (2010)). In addition, the result of this study is also in accordance with the findings of Daluba and Audu (2010) when they both found that students in a better environment had higher scores than their counterparts in agricultural science.

Research findings have shown that students' psychomotor ability do not depend on their school ownership but that students may acquire differently the learned skills being presented to them due to the type of learning environment they are exposed to. It is therefore possible that exposure to the models of problem-based learning environment which made students to benefit equally in dart manipulation psychomotor process skill acquisition irrespective of their school ownership also could have been responsible to the non-significance in the influence of school ownership in psychomotor process skill acquisition.

The results generated by this study also supported the findings of Ezugwu (2010), that teaching methods significantly affect achievement. The result of this study which shows no significant effect of treatment and school ownership on students' process skill acquisition in dart manipulation implied that students' process skill acquisition in dart manipulation was due to their differences in approaches of learning. That is to say that the process skill acquisition of public and private school students' in dart manipulation did not differ significantly. In other words, the students benefited equally due to their difference way of perceiving and interpreting information, which went further to influence their process skill acquisition differently. Table 3

also indicated that there is no significant interaction effect of treatment and school ownership on students' psychomotor process skill in dart manipulation. This findings is in line with the findings of Ankerman (1990) who posited that school ownership by method interaction is significantly and positively associated with learning outcomes in professional skills. This is an indication that there is inconsistency in research result concerning the effect of treatment and school ownership on students' process skill acquisition in dart manipulation.

6. RECOMMENDATIONS

In view of the afore-mentionable implications of the result of this study, the following recommendations were made:

- Floating facilitator model should be included in the curriculum of pre-service teachers of clothing and textile so as to popularize their use among teachers in both public and private schools.
- Government agencies and professional association whose responsibility is to design and revise the curriculum for colleges of Education should incorporate and emphasize the use of floating facilitator approach in the teaching of clothing and textile especially dart manipulation. for both private and public schools.

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