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Teachers' competency and motivational levels in teaching data processing in Port Harcourt metropolis

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Abstract
This study was undertaken to investigate into teachers' competency and motivational levels in teaching Data Processing in senior secondary schools in Port Harcourt metropolis. Two research questions and two hypotheses guided the study. The study adopted a descriptive survey design. The sample of the study was fifty-one (51) Data Processing teachers (Fifteen (15) teachers of the four public schools and thirty-six (36) teachers of the fifty-four (54) private schools). The small nature of the sample is as a result of the fact that Data Processing as one of the Trade and Entrepreneurial subjects is not a compulsory subject, hence not offered by all the public and private schools in Port Harcourt Metropolis. Two instruments developed by the researcher titled "Teachers Competency Observation Rating Scale on Data Processing (TCORSDP), and Data Processing Resources and Teachers Motivational Questionnaire (DPRTMQ)" with reliability coefficients of 0.91 and 0.74 respectively were used for data gathering. Data gathered were analyzed with, mean ($\bar{x}$), Standard Deviation (SD) and independent t-test for testing the hypotheses at 0.05 level of significance. The findings revealed that the competency level of Data Processing (DP) teachers in teaching DP in schools, both public and private were averagely good ability and there was no significant difference in the competency level of Data Processing (DP) subject teachers between public and private secondary schools in Port Harcourt metropolis. Also, the motivational levels of Data Processing (DP) subject teachers in senior secondary schools in Port Harcourt metropolis for both public and private schools were found to be moderate, and there was a significant difference between the motivational level of Data Processing (DP) subject teachers between public and private schools in Port Harcourt metropolis. Based on these findings it is recommended that the competency levels of the Data Processing teachers should be sustained and boosted by periodic workshop activities provided by school owners, in order to keep DP teachers abreast with modern ICT facilities and training associated with DP teaching. In addition, motivational level of Data Processing teachers should be improved upon and enhance by school owners by providing the needed instructional materials (media) for effective teaching of DP and the periodic provision of incentives for Data Processing teachers in the forms of sponsorship in short-term courses on ICT/Statistical/Graphical packages as well as monetary allowances for teaching Data processing.

Keywords: competency, motivation, teachers, data processing, Port Harcourt metropolis

Introduction

In the school system especially in secondary schools, the teaching of any school subject requires the use of competent and highly motivated teachers, to facilitate the teaching-learning process. In fact, the teaching of a subject like Data Processing (DP) requires a great deal of competent and motivated teachers, in the realm of Information and Communication Technology (ICT) especially in this 21st century. Consequently, the deployment of technically competent and motivated teachers of Data Processing is a sine-qua-non to students' success in the subject.

The level of competent and motivated teachers places a restriction on the degree to which any new subject can be introduced into the school curriculum, especially where only the most basic facilities have so far been provided. UNESCO 2018 states that ICT is of such importance to the future industrial and commercial health of a country, investment in teachers' education, is necessary for the effective delivery of an ICT-based curriculum and should rank high in any set of government priorities.

UNESCO 2018 further stated that teachers must know basic hardware and software operations, as well as productivity applications software, a web browser, communications software, presentation software, and management applications.

Data Processing (DP), the primary subject in this study is one of the 34 trade/entrepreneurship subjects approved for study at the senior secondary school level of the educational system in Nigeria. Data processing is a subject designed to achieve the following objectives at the secondary school level:

1. To equip students with basic skills of data processing and management;
2. To enhance the competency of students' ICT applications that will promote the acquisition of entrepreneurial skills for everyday living in the global world;
3. To provide students with knowledge in the application of ICT in facilitating business transaction and education;
4. To prepare students for further studies in Data Processing and Management (EarlyFace, 2018) [2].

The implication of the introduction of this trade/entrepreneurial subject (Data processing) by the Federal Government of Nigeria is that the federal government wants students to be economically independent. That is students are supposed to be equipped and earn a living with ICT employability skills which will be useful to

those that do not intend to further (go to the University) or are not ready to further (do not have the finance or sponsorship) immediately. An added benefit to those in the University is that they can be schooling and utilizing this data processing skills and earn a stipend from it. Students can be typing their work themselves and do for their fellow students, they can do their project themselves and for others; and do presentations with it.

A teachers' success in the classroom depends very much on the level of preparedness for the instruction process. It has been observed that the present Data Processing teachers in secondary schools are not professional Data Processing teachers or have any of them even undergone a teacher training programme on Data Processing. Sometimes, those who teach Data Processing (DP) are graduates of any of the science subjects such as Mathematics, Chemistry, Physics, Engineering and sometimes Biochemistry. And of course, many of these teachers are not education graduates (Onwioduokit & Ikwa, 2000).

It is to be noted that the teacher is the main aid to learning with, his methods, styles and techniques being additional aids. Where a teacher is deficient in a particular topic, the tendency is to dodge the areas of deficiency while the learner is bound to suffer. Ugbe and Agim (2009) [4], affirmed that a beautiful building and expensive equipment, stocked in, will not lead to effective learning without the qualified and competent teacher putting them into use and making students participate in the experimental procedures.

What is then needed to be a competent teacher? A competent teacher is a person who is professionally qualified and trained to teach Data Processing, having the necessary qualities or skills and showing adequate skills in the teaching process, (Osaat, 2004) [5]. Other competencies required of teachers include knowledge of subject-matter, pedagogy, skill processes, resourcefulness, behaviour motivation and evaluation. A competent teacher attends conferences, workshops and seminars, has a good classroom control, effective communicative skills, and adequate knowledge of the subject, as well as utilizes a variety of teaching methods, or strategies and show enthusiasm for teaching (Akinbobola, 2004) [6]. At the centre of quality teachings are teachers and students who are supposed to jointly achieve the goals, quality teaching, measured by teachers' performance through students' performance (Adair, 2009) [7].

According to Alarm and Farid (2011) [8], the motivation of teachers is very important as it affects the students directly. This fact is supported by Marques (2010) [9] who concluded that motivation, satisfaction and performance are interdependent. This means that low motivation of teachers affects his performance which affects the students' performance in turn.

Bamigboye, Bankole, Ajiboye, and George (2013) [11], investigated teachers' attitude and competency towards the use of ICT resources in their lectures. The findings revealed that the majority of the lecturers have positive attitude and competency towards the use of ICT resources in their lectures, and the use of ICT in instruction enhance the academic performance of students. The study concludes by recommending that university administration should provide more training in the area of ICT to its staff and improve on the regular and uninterrupted power supply to the campus.

Ugbe and Agim (2009) [4], investigated the influence of teachers' competence on students' academic performance in senior secondary school chemistry. Results revealed that there is a significant relationship between teachers' competence and students' academic performance in Chemistry. Chemistry students taught by qualified teachers performed significantly better than those taught by unqualified teachers. Also, chemistry students taught by experienced teachers performed significantly better than those taught by inexperienced teachers.

Aboderin and Omodara (2015) [12] examined the challenges and attitude of teachers toward the implementation of Data Processing Curriculum in Secondary Schools in Ondo State of Nigeria. The results revealed that computer resources are not available in the schools; Data Processing subject teachers are few in secondary schools in Ondo State, and teachers show a positive attitude towards the implementation of Data Processing Curriculum. The results of the study also showed things that must be put in place to ensure that Data Processing curriculum is fully implemented in the secondary schools to include: school to source for funds from well-wishers, incorporating Computer Education into teacher Education Institutions, regular in-service training for teachers, provision of enough ICT facilities, employing qualify Data Processing teachers, provision of funds and ensuring ICT gadget usage.

Consequently, it is against the above background that the following objectives were set to be achieved, research questions posed and hypotheses to be tested in this study.

Objectives

1. To establish the competency level of Data Processing (DP) subject teachers in secondary schools in Port Harcourt Metropolis.
2. To find out the motivational level of Data Processing (DP) subject teachers in secondary schools in Port Harcourt Metropolis.

Research Questions

1. What is the competency level of Data Processing (DP) subject teachers in secondary schools in Port Harcourt metropolis?
2. What is the motivational level of Data Processing (DP) subject teachers in secondary schools in Port Harcourt metropolis?

Hypotheses

1. There is no significant difference between the competency level of Data Processing (DP) subject teachers in public and private secondary schools in Port Harcourt metropolis.
2. There is no significant difference between the motivational level of Data Processing (DP) subject teachers in public and private secondary schools in Port Harcourt metropolis.

Methodology

The study is a descriptive survey design, carried out in Port Harcourt metropolis, the capital and largest city of Rivers State, Nigeria. The sample of the study was fifty-one (51) Data Processing teachers (Fifteen (15) teachers of the four public schools and thirty-six (36) teachers of the fifty-four (54) private schools). The small nature of the sample is as a result of the fact that Data Processing as one of the Trade and Entrepreneurial subjects is not a compulsory subject, hence not offered by all the public and private schools in

Port Harcourt Metropolis.

Two instruments developed by the researcher were used, Teachers Competency Observation Rating Scale on Data Processing (TCORSDP), and Data Processing Resources and Teachers Motivational Questionnaire (DPRTMQ) with a reliability coefficient of 0.91 and 0.74 respectively. Teachers Competency Observation Rating Scale on Data Processing (TCORSDP), were given to the head of Data Processing unit with the presence of the researcher to observe the teacher's ability to perform the itemized skills and rate them accordingly. The second instrument, Data Processing Resources and Teachers Motivational Questionnaire (DPRTMQ) were administered directly to the respondents by the researcher. Data gathered were analyzed with, mean ($\bar{x}$), standard deviation (SD) and independent t-test to test the tenability of the null hypotheses at 0.05 level of significance.

However, for the categorization of teachers' ability in order to ascertain their competency level of Data Processing skills, the following processes were followed: first the range of the score points was determined, i.e. range = 5 – 1 = 4, hence this value is further divided into 5 equal parts on the following continuum *viz*:

Interval `	**Range of mean scores**
Excellent ability (EA)	4.50-5.00
Very good ability (VGA)	3.70-4.40
Good ability (GA)	.80-3.60
Fair ability (FA)	1.90 - 2.70
Poor ability (PA)	1.00 - 1.80

Similarly, to determine the motivational level of the teachers, the following criteria based on the range (4 -1 = 3) score points was subdivided into four equal parts and the continuum defined as follows:

Interval	**Range of mean scores**
Low Motivational level	1.00 -1.75
Moderate Motivational level	1.76-2.50
High Motivational level	2.51-3.25
Very high Motivational level	3.26-4.00

Results

Research Question 1: What is the competency level of Data Processing (DP) subject teachers in secondary schools in Port Harcourt metropolis?

Table 1: Mean and Standard deviation Analysis of Teachers Competencies in Data Processing

	Skill Statement	**Public**	$\bar{x}$	SD	**Decision**	**Private**	$\bar{x}$	SD	**Decision**
1	Ability to Create Product using Word Processing	15	19.07	2.890	VGA	36	21.69	3.124	EA
2	Ability to Create Product using Spreadsheet	15	15.60	2.293	VGA	36	19.11	2.984	VGA
3	Ability to Create Product using Presentation Software	15	19.47	2.416	VGA	36	19.78	2.860	VGA
4	Ability to Create Product using Database	15	14.33	2.920	GA	36	16.28	1.892	GA
5	Ability to Create Product using Image Processing	15	16.13	3.114	GA	36	14.03	4.988	GA
6	Ability to Create Product using Voice Processing	15	10.33	3.200	FA	36	8.83	3.753	FA
Pooled Mean ($\bar{x}$)		15	15.82	3.266	GA	36	16.62	3.266	GA

Where: EA = Excellent Ability; VGA = Very Good Ability; GA = Good Ability;
FA = Fair Ability; PA = Poor Ability

Research Question 2: What is the motivational level of Data Processing (DP) subject teachers in secondary schools in Port Harcourt metropolis?

Table 2: Mean and Standard deviation Analysis of Teachers Motivational Level in Teaching Data Processing

	Motivation	**Public**	$\bar{x}$	SD	**Decision**	**Private**	$\bar{x}$	SD	**Decision**
1	Intrinsic Motivational Factors	15	2.83	.686	Highly motivated	36	2.91	.646	Highly motivated
2	Extrinsic Motivational factors	15	2.24	.456	Moderately motivated	36	2.54	1.135	Highly motivated
Pooled Mean ($\bar{x}$)		Public Schools	2.37	.786	Moderately motivated	36	2.49	1.527	Moderately motivated

Hypothesis 1: There is no significant difference between the competency level of Data Processing (DP) subject teachers in public and private secondary schools in Port Harcourt metropolis.

Table 3: t-test Analysis of the Mean Scores of Public and Private Schools respondents on their competency level in Data Processing

School	**n**	$\bar{x}$	Sd	t_{cal}	df	$Sig.$	$Decision$
Public	15	94.93	11.49				
				1.284	49	.205	NS
Private	36	99.72	12.39				

NS = Not Significant, p (.205) > 0.05 level of significance

Hypothesis 2: There is no significant difference between the motivational level of Data Processing (DP) subject teachers in public and private secondary schools in Port Harcourt metropolis.

Table 4: t-test Analysis of the Mean Scores of Public and Private Schools respondents on their motivational level in **Data Processing**

School	n	$\bar{x}$	Sd	t_{cal}	df	$Sig.$	$Decision$
Public	15	61.87	3.04				
				2.203*	49	.032	Significant
Private	36	67.22	9.16				

*Significant, p (.032) < 0.05 level of significance

Discussion

On the issue of the competency level of Data Processing (DP) teachers in teaching DP in schools, both public and private school teachers showed averagely good ability in their competency level as indicated by the pooled mean values and there was no significant difference in the competency level of Data Processing (DP) subject teachers between public and private secondary schools in Port Harcourt metropolis. In the views of the researcher, this expectation could be as a result of the fact that teachers who teach DP in our schools are mainly computer science education teachers or teachers that have some form of computer science skills. More so, DP knowledge, skills and values or attitudes are all embedded in the curriculum for computer science education. Hence, teachers whether public or private possess similar knowledge, skills and attitude to DP.

The present result is in agreement with the studies of Bamigboye, Bankole, Ajiboye, and George (2013) [11], Ugbe and Agim (2009), and Aboderin and Omodara (2015) [12] who in their various studies with similar variables but different school subjects, also found out that teachers who are experienced and professionally trained have competency in the subject they are teaching.

On the issue of motivational levels of Data Processing (DP) subject teachers in secondary schools in Port Harcourt metropolis, it was found out that both public and private school teachers are moderately motivated to teach Data Processing in secondary schools in Port Harcourt metropolis. On further statistical testing, the result showed that there is a significant difference between the motivational level of Data Processing (DP) subject teachers between public and private secondary schools in Port Harcourt metropolis in favour of DP teachers in private schools.

This result is, however, surprising viewed against the fact that motivation is simply the driving force that propels individuals to achieve set objectives either for themselves or for the organization they work for. One would expect that DP is a new subject and may lack the necessary instructional materials related to it, teachers may not be too interested in teaching the subject. However, the outcome of this study has proved differently. That is, despite the fact that the subject is new and may lack materials for its delivery, teachers of DP were found to be moderately in their motivational levels to teach Data Processing in our secondary schools. Nevertheless, the uniqueness of this finding is such that, the researcher could not find any study similar or dissimilar in finding to the present one as it relates to DP teachers motivational levels in teaching DP in secondary schools. To this end, the result so presented herewith could be considered as a novel in its right.

Conclusion

Based on the findings of this study it could be concluded in this study that, the competency levels of both public and private school Data Processing (DP) teachers for the teaching of DP is considered to be good ability on the average. In the same vein, the motivational levels of both public and private schools Data Processing (DP) teachers for the teaching of DP is moderately high. In addition, there is no significant difference between public school DP teachers' motivation and their private school counterparts.

Recommendations

On the basis of the findings and the conclusion reached in this study, the following recommendations are made:

1. The competency levels of the Data Processing teachers which were found to be averagely good should be sustained and boosted by periodic workshop activities provided by school owners, in order to keep DP teachers abreast with modern ICT facilities and training associated with DP teaching.
2. The typical motivational level of Data Processing teachers which were found to be moderate should be improved upon and enhance by school owners. This could be achieved by providing the needed instructional materials (media) for effective teaching of DP and the periodic provision of incentives for Data Processing teachers in the forms of sponsorship in short-term courses on ICT/Statistical/Graphical packages as well as monetary allowances for teaching Data processing.

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