

Assessment of Gender Disparity and Years of Experience in Science Teachers' Regularity in Attendance at Professional Workshops and Seminars in Calabar Metropolis, Cross River State, Nigeria

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ABSTRACT

The purpose of Science Teachers Associations (STAs) is to ensure that science teachers remain up-to-date with the latest knowledge, developments, and pedagogical skills in their field. By organizing workshops, seminars, and other intellectual meetings, STAs aim to prepare science teachers for the future challenges in their teaching careers. A recent study was conducted to investigate the influence of gender and years of teaching experience on science teachers' regularity in attending professional workshops and seminars. The study utilized an ex-post facto research design and gathered information from all 168 science teachers in the public secondary schools of Calabar metropolis, Cross River State, Nigeria. The study involved 135 science teachers who fully completed the "Teachers' workshop and seminar participation questionnaire" (TWSPQ), yielding a high Cronbach alpha reliability index of 0.92. Analysis of the data using simple percentages, independent t-test, and 2-way ANOVA revealed that a majority of science teachers had never attended professional workshops and seminars, with only 29.6% attending regularly and 64.4% attending occasionally. Notably, none of the science teachers in Calabar Metropolis attended professional seminars very regularly, with 33.3% attending regularly, 35.6% attending occasionally, and 31.1% never attending professional seminars before. Furthermore, it was found that male science teachers were significantly more regular than their female counterparts in attending professional workshops. Additionally, the study highlighted that both gender and years of teaching experience significantly influenced the regularity of science teachers in attending professional workshops, with those having more experience being more regular. However, it was noted that there was no significant difference in the regularity of male and female science teachers at professional seminars, but the regularity increased with years of teaching experience, except for those nearing retirement. In conclusion, the study emphasized the importance of personal characteristics in determining the regularity of science teachers in attending professional workshops and seminars.

Keywords: Science teachers, Gender, years of experience, attendance to seminars, workshops, professional conferences

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INTRODUCTION

Well trained and efficient teachers are the pride of any nation's education system. The Federal Republic of Nigeria (FRN, 2004) acknowledges this by strongly asserting that the quality of education cannot be higher than the quality of her teachers. This underscores the

need for science students to be taught by qualified and well equipped science teachers. It is clear that Science education is the bedrock of technological development and any nation that wants to be reckoned among the comity of nations must give attention to the quality of

science teachers in her classrooms. Teachers are the major executors of the curriculum with the students as the end recipients. Therefore, well trained and equipped teachers are likely to effectively and efficiently implement the curriculum goals. It is therefore no wonder why nations invest in the professional training and retraining of her teachers, especially as literature abounds to the impact of teacher training on students' academic performance (Akiba & Liang, 2016; Essien, Akpan & Obot, 2016; Akpam, Adie, Udayi & Ategwu, 2022). After all, what a nation desires ultimately from her teachers is the production of students equipped with the necessary knowledge, skills and wherewithal to face the current demands of her society and move the nation forward in the areas of technological development while also contributing to meeting the demands in other fields of science. There are diverse developmental programmes that teachers undertake to boost their effectiveness. These include under-taking higher degrees, short term courses, in-service training courses, attendance and participation in conferences, seminars and workshops. Many studies show that improved teachers' participation in in-service training programme results in increased student achievement (Essien, Akpan & Obot, 2016; Jepketer et al, 2015). Infact, Ekpo, Edet and Nkanna (2013) found out that "those teachers who participated in staff development programmes were more effective in their job performance in terms of knowledge of subject matter, teaching methods, classroom management and evaluation methods" (p 217). That may be the reason that the Federal Government of Nigeria, through her different agencies like the Universal Basic Education Commission (UBEC), the State Universal Basic Education Commission (SUBEB) and the National Teachers Institute (NTI) organizes workshops and seminars for basic education teachers through to the primary school teachers. Workshops and seminars are capable of building attendee's capacities and offer them the opportunity to engage in practical exercise. It also allows attendees from different backgrounds to actively participate in information sharing while offering them the opportunities to effectively learn from each other directly in an informal setting. Teachers who attend workshops and seminars are likely to have the opportunity to meet and interact with other teachers and experts in their field. Such attraction may bring to the fore new methodologies and novel approaches to teaching certain concepts. It may also give insights into some difficult concepts that teachers might have had difficulty in understanding or even difficulty in being able to transfer such knowledge to the students. Essentially, workshops are stimulating and can provide tons of benefits to participants which On Course Workshop (2018) summarizes to include:

1. Learn research-based strategic learning and

teaching practices.

2. Collaborate with colleagues on best practices.
3. Practice practical classroom strategies you can use in your classroom tomorrow.
4. Understand why many students act as they do when faced with difficult college courses.
5. Gain access to what colleagues from across the nation are doing to ensure student success.
6. Explore classroom issues that impede student success and learn how to deal with them.
7. Learn how to incorporate learning strategies into content coursework.

(<http://oncourseworkshop.com/top-10-reasons/>) On-Course Workshop. Accessed 11/04/2023).

Many professional bodies like the Mathematics Association of Nigeria, Nigeria Computer Association (NCS) and Science Teachers Association of Nigeria (STAN), usually organize workshops and other programmes for the purpose of training of their members. It was in response to the importance of science education in the progress of the nation that science teachers founded the Science Teachers Association of Nigeria (STAN) in 1957. STAN is the umbrella body for all science teachers and the objectives of the association, apart include to:

1. "Promote co-operation among science teachers in Nigeria with a view to raising the standard of science education in the country.
2. Provide a forum for discussion by science teachers on matters of interest.
3. Help science teachers keep in touch with developments in science and its application to industry and commerce.
4. Popularise science" (<http://www.stanonline.org/aims.php>)

Many professional bodies and some government agencies hold yearly seminars and workshops during which time teachers interact with and discuss difficult areas in their various teaching subjects. In this informal arena, teachers can unreservedly share their anxieties and qualms and have them allayed by the contributions of experts in the field, older more matured colleagues, and even their peers. These workshops are not only designed to equip teachers with the necessary skills but to also boost their confidence (Thomas & Inyang, 2021). Bando and Li (2014) in their study found that teachers that underwent in-service training changed classroom practices by providing more opportunities for students to actively engage in learning. They thus concluded that teacher training is likely to be effective in improving student learning. Jepketer et al. (2015) found that teacher capacity development influences students' performance to a greater extent and that teachers needed refresher training courses to improve on their

teaching performance. Essien et al (2016) also found that there exists a positive and small relationship between the frequency of teachers' attendance at in-service training, seminars and workshops and students' academic performance in Social Studies and thus strongly recommended that compulsory professional training should be on-going for both primary and secondary school teachers.

It is important that secondary school science teachers should belong to and effectively participate in activities of professional bodies and also attend workshops and seminars organized by ministries of education and other recognized subject professional bodies. However, studies have shown that attendance to conferences, workshops and seminars by science teachers in Calabar municipality is low (Ihejimaizu, Inyang & Adah, 2014). They reported that of the respondents that were registered with professional bodies, none attended conferences on a very regular basis, only 22.22% attended conferences on a regular basis while 23.61% had never attended any conferences. Of the 46.66% of science teachers not registered with any professional body, none of them attended government organized conference very regularly, 26.98% attended regularly and a whopping 52.38% had never attended any government organized conference. Lawal (2002) studying Biology teachers in Kaduna and Kano noted that very few of them attended conferences. The same thing was observed by Acholonu (2013) who reported that agricultural science teachers in Imo state only attended conferences if sponsored by the government and since government sponsorship was rare, this meant teacher attendance was poor.

On the other hand, Ibraheem (2004) found that 60.38% of his respondents attended conferences, even though they were those organized by principals of schools and Ministry of Education and not by professional bodies. Knowing the importance of seminar, workshop and conference attendance in equipping science teachers with increased skills for their work, these findings are troubling. Also, for many years now, observable teacher characteristics have been studied to understand its influence on various issues ranging from students' performance (Armstrong, 2015; Fehintola, 2014), students' achievement (Ajaja & Eravwoke, 2013; Guarimo, et al, 2015) and teachers' classroom behaviour (Thomas & Inyang, 2021). In teachers' response to professional development programmes, Tasdenair (2014) found that teachers with 6-10 years of teaching experience were more favourably disposed to professional development programmes than those with above 11years of teaching experience. The study also revealed that female teachers showed more favourable disposition to development programmes. On the other, the study by Torff and Sessions (2008) revealed that gender exerted no influence on teachers' response to

professional development but that teaching experience did. Results from their study showed that for the first two years of teaching experience, teachers showed less support for professional development but interest steadily increased subsequently until from ten years of teaching experience when interest waned again. The present study is propelled by the scanty literature on teachers' characteristics and its' influence on science teachers' attendance in workshops and seminars. Research efforts in this area are most important now because of the dire need to equip science teachers for effective service delivery.

Research question

To what extent do science teachers in Calabar metropolis of Cross River State, Nigeria attend professional workshops and seminars?

Hypothesis

Teachers' gender and years of teaching experience do not significantly influence science teachers' regularity in attendance at professional workshops and seminars in Calabar Metropolis in Cross River State, Nigeria.

METHODOLOGY

The design adopted for the study was the ex-post facto. The population of one hundred and sixty eight (168) science teachers in the twenty-two (22) public secondary schools in Calabar Metropolis served as sample for the study. However, only one hundred and thirty-five (135) of the 168 Science Teachers correctly completed the research instrument for use in data analysis. Thus, the actual sample of this study was 135 science teachers in Calabar metropolis, Cross River State, Nigeria.

Instrumentation

The only data collection instrument used was a twelve (12)-item 'Teachers' Workshop and Seminars Participation Questionnaire' (TWSPQ) made up of three sections: A- C. Section A sought for personal and demographic data of the respondents. Section B sought for data on respondents' attendance regularity to professional workshops; while section C sought for data on respondents' attendance regularity to professional seminars. Its options included "Very Regular", "Regular", "Occasionally" and "Never". The instrument has a Cronbach alpha reliability estimate of 0.92 and 0.89 for workshops regularity and seminars regularity, respectively.

RESULTS AND DISCUSSION

Research question: To what extent do science teachers in Calabar metropolis, Cross River State,

Nigeria attend professional workshops and seminars?

The answer to this question is provided by information in (Tables 1 to 4). Information in (Table 1) shows that 24.5% of the Science Teachers in Calabar Metropolis never attended professional workshops, out of which 10.4% are male and 14.1% are females. Only 1.5% attended it very regularly, and no female attended very regularly. Of the 29.6% that attended professional workshops regularly, 18.5% are male and 11.1% are female; as high as 64.4% attended occasionally out of which 20% are male and 24.4% are female. Table 2 reveals that 29.6% of the Science Teachers attend professional workshops regularly, and 44.4% attend occasionally; 24.4% never attend at all while 1.5% attended very regularly. Of this distribution, science teachers with 6-10years of teaching experience make up 8.1% regular, 21.5% occasional and 1.5% very regular attendance. Those between 1 – 5 years of experience have 6.7% occasional attendance and 3.7% regular attendance. As high as 19.3% never attended workshop within this bracket of teaching experience. Those with above 15years of experience do attend professional workshop, 9.6% regularly and 9.6% occasionally.

The information in (Table 3) shows that out of the 33.3% of science teachers who attend professional seminars regularly, 17% are male while 16.3% are female, and of the 35.6% of science teachers, who attend professional seminars occasionally, 20.7% are male and 14.8% are female. A higher proportion of those who never attend professional seminars are female (18.5%) while 12.6% are male that never attended. It is also revealed that none of the science teachers in Calabar Metropolis of Cross river State, Nigeria attended professional seminars very regularly. Table 4 shows that 31.1% of science teachers never attended professional seminars, all of them are below 11 years of teaching experience.

Of the 31.1% science teachers who never attended professional seminars, 19.3% are between 1-5years of experience, 11.9% are between 6 - 10years of teaching experience. Of the 35.6% who attended seminars occasionally, 8.9% are below 6years of experience, 12.6% are between 6-10years, 6.7% are between 11 and 15years, while 7.4% are above 15years of experience. Of the 35.6% with regular attendance, 15.% are less than 6years of experience, 11.9% are between 6 and 10years of experience, 8.1% are between 11 and 15years experience; and 11.9% are above 15years of experience. None of the science teachers in Calabar metropolis, Cross River State, Nigeria attended professional seminars very regularly.

Hypothesis

The null hypothesis states that teachers' gender and

years of experience do not significantly influence level of science teachers' attendance to professional workshops and seminars in Calabar Metropolis of Cross River State, Nigeria.

Results of the analyses are presented in (Tables 5 – 8). The information in (Table 5) shows that there is a significant main effect of gender on science teachers regularity at professional workshops ($F=11.559$; $p=0.001$); and there is a significant main effect of years of teaching experience on science teachers' regularity at professional workshops ($F=24.147$; $p=0.000$), but there is no significant interaction effect of gender and years of teaching experience on science teachers regularity at professional workshops ($F=.486$; $p=.291$). Hence the null hypothesis is rejected at the 0.05 level of significance for attendance at professional workshops. To establish the direction of influence of gender and years of teaching experience on regularity of science teachers' attendance at professional workshops, independent t-test analysis and Post Hoc test using Fishers' Least Significant Difference (LSD) test was performed as presented in (Tables 6 and 7). The result in (Table 6) shows that male science teachers are significantly more regular in attendance at professional workshops than female teachers ($t=2.13$; $p=0.035$). The information in (Table 7) shows that science teachers with 1-5years of teaching experience are significantly less regular at professional workshops than those between 6 and 10years, 11 and 15years and those above 15years. Science teachers with teaching experience of 6-10years are significantly less regular than those with 10-15years and those with above 15years of teaching experience. However science teachers with 11-15years of experience do not significantly differ in their regularity at professional workshops.

The influence of gender and years of teaching experience on regularity at professional seminars is presented in (Table 8). The results of the analysis as presented in (Table 8) shows significant main effects of years of experience ($F=10.973$; $p=0.000$) on regularity in attendance at professional seminars. It also reveals a non-significant effect of gender ($F=1.205$, $p=0.086$) and a non-significant two-way interaction between teaching experience and gender ($F=0.979$; $p=.068$). This means that there is significant influence of years of experience but no significant influence of gender on science teachers' regularity at professional seminars. To show how years of experience influence regularity of attendance at seminars, a Post Hoc test using Fisher's Least Significant Difference (LSD) test was performed as reported in (Table 9). Table 9 reveals that science teachers with 1 – 5 years of experience have significantly lower regularity in attendance at professional seminars than those with 6 – 10 years, 11 – 15 years and those above 15 years. Also, science teachers with 6 – 10 years of teaching experience have significantly lower regularity

Table 1: Science teachers' attendance at professional workshops by gender.

Attendance at Professional Workshop	Gender		Total (%)
	M (%)	F (%)	
Very regularly	2 (1.5)	0 (0)	2 (1.5)
Regularly	25 (18.5)	15 (11.1)	40 (29.6)
Occasionally	27 (20)	33 (24.4)	60 (64.4)
Never	14 (10.4)	19 (14.1)	33 (24.5)
Total	68 (50.4)	67 (49.6)	135 (100)

Table 2: Science teachers' attendance at professional workshop by years of experience.

Attendance at professional workshop	Years of teaching experience				Total (%)
	1-5yrs (%)	6-10yrs (%)	11-15yrs (%)	Above 15yrs (%)	
Very regularly	0(0)	2(1.5)	0(0)	0(0)	2(1.5)
Regularly	5(3.7)	11(8.1)	11(8.1)	13(9.6)	40(29.6)
Occasionally	9(6.7)	29(21.5)	9(6.7)	13(9.6)	60(44.4)
Never	21(19.3)	7(5.2)	0(0)	0(0)	33(24.4)
Total	40(29.6)	49(36.3)	20(14.6)	26(19.3)	135(100)

Table 3: Science teachers' attendance at professional seminars by gender.

Attendance at Professional Seminars	Gender		Total (%)
	Male (%)	Female (%)	
Very regularly	0(0)	0(0)	0(0)
Regularly	23(17.0)	22(16.3)	45(33.3)
Occasionally	28(20.7)	20(14.8)	48(35.6)
Never	17(12.6)	25(18.5)	42(31.1)
Total	68 (50.4)	67 (49.6)	135 (100)

Table 4: Science teachers' attendance at professional seminars by years of teaching experience.

Attendance at professional seminars	Years of teaching experience				Total (%)
	1-5yrs (%)	6-10yrs (%)	11-15yrs (%)	Above 15yrs (%)	
Very regularly	0(0)	0(0)	0(0)	0(0)	0(0)
Regularly	2(1.5)	16(11.9)	11(8.1)	16(11.9)	45(35.6)
Occasionally	12(8.9)	17(12.6)	9(6.7)	10(7.4)	48(35.6)
Never	26(19.3)	16(11.9)	0(0)	0(0)	42(31.1)
Total	40(29.6)	49(36.3)	20(14.8)	26(19.3)	135(100)

Table 5: 2-way Analysis of variance (ANOVA) of the influence of gender and years of experience of science teachers on the regularity at professional workshops.

Source of variance	SS	df	MS	F	Sig. of F
Gender	4.464	1	4.464	11.559*	0.001
Years of experience	27.978	3	9.326	24.147*	0.000
Gender X years of experience	1.459	3	.486	1.259	0.291
Error	49.05	127	.386		
Total	80.14	134			

*Significant at the 0.05 level of significance

Table 6: Independent t-test analysis of the influence of gender on science teachers' regularity at professional workshops.

Gender	n	$\bar{X}$	SD	t	Sig of t
Male	68	2.22	0.81		
Female	67	1.94	0.72	2.13*	0.035

*Significant at the 0.05 level of significance

Table 7: Fishers LSD of the influence of years of teaching experience on science teachers regularity in attendance at professional workshops.

Years of teaching experience		Mean difference (I-J)	Standard Error	p-value
(I)	(J)			
1-5years	6 - 10years	-.6883*	0.1324	0.000
	11 – 15years	-1.075*	0.1702	0.000
	Above 15years	-1.025*	0.1566	0.000
6-10years	11 – 15years	-0.3867*	0.1649	0.021
	Above 15years	-0.3367*	0.1508	0.027
11-15years	Above 15years	.0500	0.1848	0.787

*Significant at the 0.05 level of significance

Table 8: Two-way ANOVA of the influence of gender and years of teaching experience on science teachers' attendance at seminars.

Source of variance	Sum of Squares	df	Mean Square	F	Sig.
Years of experience	32.920	3	10.973	27.316	0.000
Gender	1.205	1	1.205	2.999	0.086
Years of Service X Gender	2.938	3	0.979	2.438	0.068
Error	51.018	127	0.402		
Total	86.933	134			

*Significant at the 0.05 level of significance

Table 9: Fishers LSD of the influence of years of teaching experience on science teachers' regularity in attendance at professional seminars.

Years of teaching experience		Mean difference (I-J)	Standard Error	p-value
(I)	(J)			
1-5years	6 - 10years	-0.6000*	0.1351	0.000
	11 – 15years	-1.1500*	0.1736	0.000
	Above 15years	-1.2154*	0.1597	0.000
6-10years	11 – 15years	-0.5500*	0.1682	0.001
	Above 15years	-0.6154*	0.1538	0.000
11-15years	Above 15years	-0.0654	0.1885	0.729

*Significant at the 0.05 level

in attendance at professional seminars than those with 11– 15 years and those above 15 years of experience; but science teachers with 11 – 15 years of experience do not significantly differ from those above 15 years of experience in their regularity at professional seminars.

DISCUSSION

It is thus clear that science teachers' years of experience significantly influence their regularity in attendance to workshops and seminars. On the other hand, gender exerts influence on regularity in attendance to workshops but not attendance to seminars. Results show that teachers with less than 11 years of service tend to have the highest rate of non-attendance to these professional development programmes. They exhibit very poor attendance records to these development programmes. Results also reveal a trend in increase in attendance to workshops and a decrease in the number of teachers that have never attended workshops as the years of service increases. Results also show that those that have taught for more than 15 years tend to attend workshops more occasionally and it is very relieving to note that all that

have taught for not less than 10years have attended seminars and workshops either on a regular basis or occasionally. At least these categories of science teachers make regular or occasional efforts to attend workshops organized for their professional development. One would have expected the younger teachers to be more eager to receive any form of professional development programmes offered them to ensure efficient service delivery in their new jobs. However it is not surprising that teachers with less number of years of service may not show much interest in professional development because most people coming into the teaching profession only do so as second choice. Teaching is not commonly the first choice of career for most people in the Nigerian environment because of the poor remunerations and working conditions. It is therefore not surprising that they may not show much interest in improving themselves as they are almost always on the lookout for greener pastures in other establishments or employments.

The occasional attendance by science teachers with more than 15 years of teaching experience to workshops may be postulated to be as a result of more

confidence and experiences gained during their long years of interactions in the service. At this age in their service they may feel that there are not much novel things to be learnt; thus their lethargic response to these training workshops. Apart from this is the fact that education is poorly funded and so one cannot rule out the fact that financial constraints may be at the root cause of the younger science teachers' inability to attend these workshops and perhaps the older teacher has been able to save ahead towards these programmes. Whatever the reasons though, this result agrees with the findings of Ihejimaizu, Inyang and Adah (2014) who found out that very few teachers do attend conferences regularly and also that the female science teachers are consistently low in participation in conferences 36(26.67%) compared to their male counterparts 14(10.37%).

The results of this study also agrees with Torff and Sessions (2008) whose study revealed a trend which showed that teachers, in their first 2 years of teaching experience were less supportive of professional development programme like workshops but that interest rose thereafter until the ten-year mark when their interest and response waned again to a similar level relative to first-year teachers. In the same study by Torff and Sessions (2008) gender exerted no influence on their attitude or response to professional development programmes.

The study also confirms the results obtained by Tasdenair (2014) who found that teachers' teaching experience significantly influenced teachers' response to professional development programmes. That study revealed that teachers with 6-10 years of teaching experience were more favourably disposed to professional development programmes than those with above 11years of teaching experience. The result of this present study does not agree with that obtained by Taşdemira (2014) on the issue of gender influence with regards to attendance to seminars, but certainly agrees with this study with regards to attendance to workshops. It is interesting to note that gender significantly influences workshops attendance but not seminars. The reason for this may be as a result of the difference between these two programmes. Seminars usually take the form of academic instructions that target some particular subjects, with the main purpose of passing on knowledge. Workshops on the other hand are usually more intense with lots of demonstration and emphasis on hands-on-practice. Although they usually include all the elements in seminars, workshops are usually designed to reinforce concepts, skills and ensure mastery. Thus they are usually more technical and therefore may not be surprising that attendance to workshops should be influenced by gender. Again, female teachers' attendance to domestic cores is likely to reduce their regularity to workshops. Generally however, the result of this research confirms the results of earlier studies which all reported

low teachers attendance to organized professional development programmes (Lawal, 2002; Acholonu, 2013; Ihejimaizu, Inyang & Adah, 2014).

Implication of the study results to science teachers

It is imperative for science educators to continuously stay updated with the latest knowledge, advancements, teaching techniques, and innovations in their respective fields. This necessitates active participation in workshops and other intellectual forums organized by professional associations, educational ministries, or other relevant agencies. The significance of attending these professional development programs cannot be emphasized enough, as they are akin to the refreshing air that rejuvenates and invigorates the mind. The implications of these findings for education in Cross River State underscore the need for government-led awareness campaigns to motivate teachers to engage in these workshops and seminars. Without such initiatives, science educators in Cross River State may struggle to adequately prepare themselves to cultivate students who can thrive in the globally competitive landscape of the 21st century.

Conclusion

Based on the evidence presented in the study, it can be concluded that certain personal characteristics of science teachers play a significant role in their attendance to professional development programs such as seminars and workshops. Specifically, factors such as gender and years of teaching experience were found to be influential in this regard. These findings highlight the importance of considering individual attributes when designing and implementing professional development initiatives for science educators. It is evident that a more tailored approach, taking into account the diverse characteristics of teachers, may lead to increased engagement and effectiveness of such programs.

This study Highlight

- 1) Science teachers' gender and years of teaching experience significantly influence their regularity at professional workshops. Specifically, male science teachers are significantly more regular at professional workshops than female science teachers. Also, the higher the science teachers' years of experience the more regular they are at professional workshops except when they are close to retirement.
- 2) Male and female science teachers do not significantly differ in their regularity at professional seminars; but years of teaching experience significantly influences science teachers' regularity at professional

seminars. Specifically, the higher the science teachers' years of teaching experience, the higher their regularity at professional seminars except when they are close to retirement.

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