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Influence of Students' Engagement in Apprenticeship on their Learning Readiness and Academic performance in Mathematics

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Abstract

Students' engagement in apprenticeships is becoming a general phenomenon in Nigeria, especially among low-income earners. The alarming rate of unemployment and the quest for surviving the impact of economic hardship are the root causes and its consequence on students' academic performance has generated mixed feelings among researchers. Therefore, the present study sought to establish the level of secondary school students' engagement in apprenticeship and its effect on their learning readiness and academic performance in mathematics. The study was a survey type. Multistage sampling methods were adopted to select the 600 secondary school students from all schools in Ibadan. The findings revealed that more than half of the students 68% were engaged in apprenticeship and there exists a significant inverse correlation between student's level of engagement in apprenticeship and their learning readiness ($r = -.133$, $p < 0.05$). Also, the students who do not engage in apprenticeship ($\bar{c} = 16.01$ SD = 1.07) performed better than those who were engaged in such ($\bar{c} = 12.92$, SD =3.22), $t_{(598)} = -11.226$, $p < 0.05$. The practice is common in the less city and there is no gender disparity. Parents should engage their children in apprenticeship at the appropriate time and closely monitor their activities.

Key Word: Apprenticeship, Engagement, Learning Readiness, Mathematics Performance

Introduction

Students' engagement in apprenticeships is becoming a general phenomenon in Nigeria, especially among low-income earners. This has been attributed to many factors which include the fear of the alarming rate of unemployment among graduates. Earlier studies have revealed a variety of factors that contributed to pupils' poor academic performance, particularly in mathematics. Among the factors highlighted are those classified as societal, household, school, teacher, and student-related. Home -related factor became imperative considering the number of hours that students spend at home. The type and level of student engagement at home is one of the home-related elements. It is what students do while they are not in school, whether after school, on weekends, or on holidays. Because of the manner in which certain students handled their academic work, this became a matter of concern. Many students appear to be physically present in class, but their thoughts appear to be elsewhere. Experience as a mathematics teacher for over two decades shows that students' attitude toward mathematics assignments or homework is getting worse. Many of them would not attempt the assignment and among the few of those who did, many would only copy from their friends, not minding whether they understood it or not, but just to avoid being punished for not doing their assignment. One of the major excuses given by these students is that they went to shop or workplace where they are learning either a trade or a skill.

It has been observed that this practice of apprenticeship has occupied their time more than academic work. They even take this (apprenticeship) more seriously than their studies. The reason for this is not far-fetched; interaction with many students revealed that they get little money from this practice, which they see as a succor to the economic hardship being experienced. Some also consider the practice to be preferable to schooling; why? Because of the unemployment rate among our graduates nowadays, this is the reason many parents intentionally engage their children in the practice, either formally or informally, not minding its adverse effect on students' academic performance. It is therefore imperative to find out the effect of this practice on the students' learning readiness and their academic

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performance in mathematics.

Research findings have attributed unsatisfactory performance of students to many factors under the following categories, students, home, teachers, school, and societal factors, even though there may be linkages between two or more factors. One of the leading factors is home related factor, because students spend more time at home (between 2 p.m. and 8 a.m. the following day) than they do at school (between 8 a.m. and 2 p.m.). Even those schools that run extra lessons close by 4 p.m. This shows that, on the average, students spend two-thirds of their time at home on a daily basis, apart from the holidays. Therefore, their activities after school hours should be a source of concern to a teacher who is result-oriented. As such, the influence of family characteristics on students' academic performance cannot be undermined. One of the common practices of some families is to engage their children in apprenticeships either for income immediate generation or for preparing the children for future employment-related challenges.

Apprenticeship can be said to be an arrangement whereby a learner (apprentice) agreed to learn and serve under the tutelage of a master who has agreed to teach a skill/ trade to the apprentice. Such an arrangement could be formal or informal. It is formal when there is written agreement between the two parties (Apprentices and Master), the time frame, the financial implication and guiding rules and regulations are well spelt out. It is informal when there was no formal arrangement between the apprentices and the master. This occurs mostly when the master is related to the apprentice in one way or the other, it could be parental, friendship or on the platform of rendering social service to humanity.

According to Barab and Hay (2001), apprenticeship can be said to be the act of combining on-the-job training under the tutelage of journey-level craft person with classroom instruction. This according to Abari et al (2018) enables individuals to acquire technical knowledge and practical experience in a real workplace, as well as other functional and personal skills that are required not only for apprentices' current jobs but also for their future careers . Osinem and Nwoji (2010) opined that the benefit of an apprenticeship programme can be maximized when it is well-planned and appropriately supervised. Contrary to this, most of the students who engaged in the practice were not adequately monitored. This seems to be reflecting in the manner in which they handle their academic pursuits.

Some students go to where they are serving as apprentices immediately after school hours, while some make use of their weekend or vacation period. The most disturbing aspect of this practice is that many students engage in apprenticeship skills that have no correlation with what they are pursuing or the subjects they registered for in school (Abari et al 2018). For instance, there were cases of students in Art class who went for the training to become an auxiliary nurse.

At a point in the educational system of Nigeria, 6-3-3-4 was introduced purposely to build in entrepreneurship into the educational system. This implies that the first six years would be spent in primary school, followed by three years in junior secondary school, another three years in senior secondary school, and the last four years in a higher institution of learning. The major aim of the programme was to provide different opportunities for secondary school students to identify their potential and pursue it to lofty heights. What could have been the major advantage of the programme was its ability to accommodate entrepreneurship in the Nigerian educational system, which could have provided an opportunity for the youth to be gainfully employed even after secondary school. Unfortunately, the system was not well implemented. Due to the difficult economic situation, many parents nowadays engage their children in one apprenticeship/entrepreneur or another. It is so common that some students start this apprenticeship at an early age (in primary school). This practice positioned the students in a situation where they may not find learning academic work interesting, as a result, they may not show any readiness for learning.

Learning Readiness according to Visser and Van Zyl (2013) is the degree to which a student

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possesses the necessary emotive-altitudinal, cognitive, behavioral characteristics, skills, and orientations to be a successful learner. There are five components in this submission: emotional-attitude, cognitive, behavioral characteristics, skill, and required orientation. Learners with readiness qualities, abilities, and orientations are thought to adapt to, feel comfortable with, and acquire more academically than those with lower degrees of readiness. These students will be more open to academic difficulties. No effective learning can take place without learners' readiness to learn; otherwise, all the efforts that a teacher might have put in place would be in vain.

Abari et al (2018) in their study to establish the relationship between apprenticeship and students' academic performance in public junior secondary schools, find out that both students on apprenticeship and those who do not engage in apprenticeship had same academic performance. Also, their result showed no disparity between male and female students on apprenticeship. This position was corroborated by Lawani (2021) who concluded from a study that students' academic performance in Mathematics was not affected by the students' engagement in afterschool artisan apprenticeship. The findings of these studies may likely be attributed to the fact that the students are adequately monitored both during and after school hours.

Contrary to the earlier mentioned studies, Abdulganiyu and Alabi (2020) confirmed a link between apprenticeship and academic achievement of secondary schools girls. This finding was in line with that of Adeyeye (2009), who stated that there is a significant relationship between apprenticeship and the academic performance of girl children, who certainly divided attention to formal learning and are likely to shift their attention to areas where they have monetary advantage. There seems to be a contradiction in the reviewed studies; it is therefore necessary to carry out further study to authenticate the current position.

Purpose of the Study

The purpose of the study was to:
establish the level of students' involvement in apprenticeship.
ascertain the gender disparity in students' involvement in apprenticeships
establish the influence of students'\ involvement in an apprenticeship on their academic performance in mathematics

Research Questions

1. What is the level of students' engagement in apprenticeship based on
   a gender?
   b. location?
2. What type of relationship exists between a student's level of engagement in an apprenticeship and Mathematic learning readiness?
3. Is there any significant difference in Mathematics academic performance of students who engage in entrepreneurship and those who do not?

Methodology

The study was a survey type. The target population for the study was all secondary school students in the Ibadan Land. The eleven (11) local government areas in Ibadan were stratified into two, city (5 LGA) and the less city (6 LGA). One local government area was randomly selected from each of the strata. A proportionate sampling technique was used to select 10 schools from the selected local government areas. In each of the schools selected, 30 students were randomly selected from JSS 2 students and 30 students from SS 2 students, making a total of 60 participants per school.

Three research instruments were used for this study. Student Engagement in Apprenticeship Questionnaire (SEAP), The Self-Directed Learning Readiness Scale (SDLRS) and Mathematics Assessment Proforma (MAP)
Student Apprenticeship Engagement Questionnaire was a self-developed questionnaire to assess the level of students' engagement in apprenticeship. Section A of the questionnaire was on the demographic data of the respondents, while section B was to elicit information about the level of engagement of the students. Questions such as when they stated the apprenticeship, the time they go for the apprenticeship, and the quality of the time they

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spend on the apprenticeship were included in the questionnaire. Both closed and open-ended response formats were adopted to allow the respondent to give detailed information where necessary. The instrument was given to 3 experts in the field of measurement and evaluation to assess and rate the appropriateness of the items.

Self-Directed Learning Readiness Scale (SDLRS) was developed by Murray J. Fisher (Fisher, King & Tague 2001 cited in Kumar et.al 2021). SDLRS is a 40 items scale with three subscales (self-management - 13 items, desire for learning - 12 items and self-control -15 items) .the instrument was recently validated by Kumar et al 2021. The results of the EFA showed that four items (Q2, Q12, Q13 and Q 25) were not loaded on any of the factors. The modified model showed that the three sub-scale (self-management, desire-for-learning and Self-control) accounted for 25.36%, 17.50% and 22.40% of the total variance respectively. The reliability coefficient of the modified 36 items which comprises self-management (10 items), desire for learning (11 items), and self-control (15 items) was established by the researcher using ordinal alpha ($r = 0.73$).

MAP was used to obtain the total performance of the students for the whole term. Students' responses to assignments and class exercises were assessed, their continuous assessment score as well as their performance in their end of the term examination were covered in the pro forma. All these were added together to give the overall performance of the students in mathematics. The computation was done with the help of the mathematics teachers in each of the selected school. The students were rated based on the number of time they have attempted the assignment and class exercises given to them by their respective mathematics teachers. Their respective scores in Continuous Assessment and first terminal examination for 2022/23 academic session were standardised using T – Score ($T = 10Z + 50$).

$$\text{Assignment} = \frac{\textit{Number of time the students attempt the give Assignments}}{\textit{Number of Assignment Given}} \text{ X } 10$$

$$\text{Class Exercises} = \frac{\textit{Number of time the students attempt the give class Exersies}}{\textit{Number of Class Exercises Given}} \text{ X } 10$$

Continuous Assessment (CA) = Total Scores Obtained in the C.A standardised using T-score ($T = 10Z + 50$)

End of the Term examination = Total scores obtained in first term examination standardised using T- Score ($T = 10Z + 50$)

Table 1: Pro formal of the Excel Spreadsheet for the Computation of Student Performance in Mathematics

S/N	Assignment	Class Exercise	Continuous Assessment	First Terminal Examination	Total

Data Collection

The selected schools were visited by two research assistants. With the permission of the school authorities and the help of the mathematics teachers, the research assistants administered the questionnaire to 30 randomly selected students from JSS2 and 30 randomly selected students from SS2. Mathematics Assessment Pro forma (MAP) was used to compile the overall performance of students in mathematics. This was done with the assistance and maximum cooperation of the mathematics teachers in the schools.

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Results and Discussion

Table 2: Cross tabulation of Engagement in Apprenticeship and Gender

			Engagement in Apprenticeship		
			Yes	No	**Total**
Gender	Male	Count	188	112	300
		% within Gender	62.7%	37.3%	100.0%
	Female	Count	182	118	360
		% within Gender	60.7%	39.3%	100.0%
Total		Count	370	230	600
		% within Gender	61.7%	38.3%	100.0%

Table 2 shows the cross tabulation of the number of students who engage in apprenticeship and those who do not based on their gender. The table revealed that 61.7% of the respondents were engaged in practice of apprenticeship while 38. 3% did not. The table further shows that the percentage of male students (62.7%) who engaged in the practice of apprenticeship are more than the percentage of female students 60.7%.

Table 3 Cross tabulation of Engagement in Apprenticeship and Location

			Engagement in Apprenticeship		**Total**
			Yes	No	
Location	City	Count	169	191	360
		% within Location	46.9%	53.1%	100.0%
	Less City	Count	183	57	240
		% within Location	76.2%	23.8%	100.0%
Total		Count	370	230	600
		% within Location	61.7%	38.3%	100.0%

Table 3 shows the cross tabulation of the number of students who engage in apprenticeship and those who did not based on their location. The table shows that 76.2% percentage of the students sampled in the less city were engaged in apprenticeship while only 23.8% did not. The table further shows that in the city more than half of the students (53.1%) sampled do not engage in apprenticeship while 46.9% were engaged in the practice of apprenticeship. This implies that more students were engaged in apprenticeship in less city than in the city.

Table 4: Relationship between Students' Level of Engagement and Learning Readiness.

		Learning Readiness	**Level of Engagement**
Learning Readiness	Pearson Correlation	1	-.133**
	Sig. (2-tailed)		.004
	N	370	370
Level of Engagement	Pearson Correlation	-.133**	1
	Sig. (2-tailed)	.004	
	N	370	370

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Tables 4 shows the relationship between students' level of engagement in apprenticeship and their learning readiness using Pearson Product-Moment Correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity. The table revealed that there was significant negative correlation between students' level of engagement in apprenticeship and their learning readiness, r = -.133, n = 370, p < 05. This implies that the more the students are engaged in apprenticeship the less their readiness for academic work.

Table 5 : Independent T-test table showing means difference between students who engaged in apprenticeship and those who do not

	Apprenticeship	N	Mean	S.D	T	Df	Sig	Decision
Performance	Engaged	370	12.92	3.215	-11.226	598	.000	Significant
	Not Engaged	230	16.01	1.069				

Table 5 shows the result of the independent t – test carried out to check if there is any significant difference in the academic performance of students who engaged in apprenticeship and those who did not. The table revealed that there was significant difference in the performance of students who did not engage in apprenticeship ($\bar{x}$ = 16.01 SD = 1.07) and those who were engaged ($\bar{x}$ = 12.92, SD =3.22), $t_{(598)}$ = -11.226, p < 0.05. This implies that the students who did not engage in apprenticeship performed better than those who did.

Discussion

The result of the findings showed that more than half of the students sampled engaged in one type of apprenticeship or another, with little difference between males and females. This may likely be associated with the fact that parents felt there was every need for their children to learn a skill considering the rate of unemployment in the society. It was also shown from the findings that the practice is more common in less city. This may not be unconnected with the fact that there are more job opportunities in the city than in the less city. The findings also showed that correlation between students' level of engagement in apprenticeship and their learning readiness was significant even though it was negative. This simply means that the more the students were engaged in apprenticeship, the less their readiness to learn academic work. This was reflected in the way they handled their homework and assignments. The majority of them don't do their homework or assignments, let alone have time for personal reading. Lastly, the findings show that there was a significant difference between the mean scores of students who did not engage in apprenticeship and those who were engaged. Students who did not engage in apprenticeship performed better than those who did. This was in line with Adeyeye (2009), who established a significant relationship between apprenticeship and the academic performance of girl children, who certainly has divided attention to formal learning, and she is likely to shift more attention to areas where she has monetary advantage. Also the preset study was in line with the finding of Abdulganiyu and Alabi 2020 established relationship between apprenticeship and academic achievement of secondary schools girls. However, the finding of this study negates that of Abari, Adetunji, Onilude, and Orunbon (2018) and Lawal 2021 who concluded from their respective studies that there was no significant difference in academic performance of students on apprenticeship and those who do not engage in apprenticeship.

Conclusion

From the results of the findings, it could be inferred that many students engaged in apprenticeship and their level of engagement is affecting both their readiness for academic work and their performance in mathematics, though the practice could be seen as a panacea to reduce the unemployment rate and provide succor to the financial hardship of some students whose parents' income were low.

Recommendations

Going from the findings of this study, it was recommended that government should regulate the practice of students engagement in apprenticeship and parents also should monitor and supervise their children's activities

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especially those who combine schooling with apprenticeship. It is advisable to allow the students to complete their secondary school education before they start being apprentices, this will allow them have full concentration in the school.

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