Examining the Effects of Demographic Factors on Open School Learners' Academic Performance in Dar es Salaam Region, Tanzania

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Abstract

Open schools in Tanzania aim to expand access to secondary education for learners who may be out of school for various reasons, offering a second chance and addressing deficiencies in formal secondary education that are not accessible to everyone due to admission criteria. Despite this, there is a significant disparity in academic performance among learners in Open schools. This paper examines the potential effect of demographic factors: age, educational level, and occupation, on the academic performance of these learners. The study employed a quantitative research approach with a cross-section-survey design to collect data from a sample of 30 Open schools and 454 learners. The results showed that demographic factors among learners in Open schools do not have a discernible effect on their academic performance. These findings suggest that demographic characteristics do not serve as the determinants of the learners' academic performance in Open schools.

Keywords: *examinations, determinants, formal education, non-formal education, open schools*

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Introduction

Open schools are a form of Non-formal Education (NFE) that provides organised and systematic instruction outside the Formal Secondary Education (FSE) framework, offering educational opportunities to individuals of all ages while operating within the lifelong learning paradigm (Ministry of Education, Science and Technology [MoEST], 2022). The reasons for establishing Open schools vary from one region to another in the world. For instance, open schools in India began as a way of reducing the number of students in formal secondary education and assisting learners in private schools to perform well in secondary education examinations (Dewal, 1994). The Indian government afterwards established the National State of Open Schooling to provide counselling and quality assurance services in these schools (Rumble & Koul, 2007; Hughey et al., 2008). In Latin America, Open schools were introduced as a way to co-

mplement and compensate for the shortcomings of the formal secondary education system (Coombs & Ahmed, 1974). Learners of Open Secondary schools in Latin America follow the curriculum, sit for examinations and receive certificates in the same way that students in formal schools do. However, Open-school learners in Latin America differ from formal students in their mode of attendance. Some attend part-time schools, correspondence schools, evening classes for adults and distance learning via radio and television (UNESCO & Hopper, 2006).

In Africa, Open secondary schools began as a means of increasing access to secondary education for primary school leavers who were not selected for secondary schools and formal secondary school drop-outs (Southern Africa Development Cooperation [SADC], 2012). In Tanzania, the introduction of non-formal education at the secondary level was prompted by the demand from many youths and adults who were unable to access formal secondary education for various reasons, including but not limited to failing primary school, leaving examinations and dropping out of the formal education system. As a response, Open schools were established to enhance access to secondary education in the country (Institute of Adult Education [IAE], 2020a). Therefore, the Open school learners comprise diverse groups, including primary school leavers who were not selected for FSE, adolescents who could not complete FSE due to dropout, individuals who failed previous national examinations, and employed adults aspiring to obtain a secondary education certificate for career advancement (Kanukisya, 2012; MoEVT, 2013; IAE, 2020a).

Within Open schools, learners exhibit variations in demographic characteristics, encompassing differences in age (ranging from youths to adults), educational levels (including both primary and secondary education), and occupational statuses (including the employed, self-employed, and unemployed). These variations in demographic characteristics among Open school learners prompted a hypothesis that they might affect academic performance in the Certificate of Secondary Education Examination (CSEE) despite the extensive reforms aimed at improving access to this level of education. The secondary education reform initiated in 2004 through the Secondary Education Development Programme (SEDP) aimed to increase the proportion of Tanzanian youths who complete secondary education with acceptable learning outcomes. This reform specifically aimed to improve access, equity, and the quality of secondary education to accommodate many primary school leavers (MoEVT, 2010; Adult and Non-formal Education Development Programme [ANFEDP], 2012-1017). The increase in access to secondary education was facilitated by the incorporation of Open and Distance Learning (ODL), ensured by the formulation of guidelines for establishing and registering Open schools in Tanzania (MoEVT, 2010; MoEVT, 2013). Quality improvement in secondary education was designed to raise the pass rate in divisions I—III in the CSEE from 36% in 2004 to 70% in 2009 (MoEVT, 2010).

Academic Performance of Learners in Open Schools

Test scores and academic performance serve as essential metrics for assessing learners' achievement in any education system. In Tanzania, the academic performance of learners in both Open schools and formal secondary education is evaluated in the CSEE using divisions and point scores. A minimum of seven subjects is examined, with each subject being graded on a scale consisting of five grades: Grade A, which corresponds to point 1; Grade B, which is equivalent to point 2; Grade C, which represents point 3; Grade D, which correlates with point 4; and Grade F, which denotes point 5. Cumulative points determine the learner's division, where Division I ranges from points 7 to 17, Division II spans points 18 to 22, Division III covers points 23 to 25, Division IV encompasses points 26 to 33, and Division 0 extends from points 34 to 35 (National Examination Council of Tanzania [NECTA], 2022). An analysis of the academic performance in schools registered as Open schools and sat for CSEE from 2018 to 2021, based on the NECTA's specified score criteria, reveals that only a limited number of candidates achieved the targeted Divisions I to III, as mandated by the 2004 education reform. See Table 1 below for further details.

Table 1

Learners' Performance in CSEE in 21 Open Schools from 2018 to 2021

C/N		School	Region	2018		2019		2020		2021	
				I-III	IV-0	I-III	IV–0	I-III	IV–0	I-III	IV-0
5296		Ifingano	Songwe	1	22	6	17	0	1	-	-
5321		Kinondoni	DSM	4	364	4	279	-	-	-	-
5386		Kamanija	DSM	2	36	12	78	0	21	0	33
5510		Kiwahode	DSM	1	14	0	34	-	-	3	14
5513		Hovinais	Arusha	1	19	0	14	0	0	0	27
5522		Ngunya	Moro.	13	9	12	78	8	86	10	81
5598		Tangini	Pwani	0	34	12	39	-	-	0	25
5599		Bright	Mara	2	53	2	43	0	20	0	17
5604		Michel J.	Njombe	4	35	3	29	0	2	2	13
5375		Kusekwa	Mwanza	-	-	2	43	3	19	2	20
5671		Udacare	Tabora	-	-	0	15	-	–	0	2
5672		Sakape	Simiyu	-	-	0	15	-	-	-	-
5709		Cydic	Tabora	-	-	0	19	-	-	-	-
5712		Wesley	Mwanza	-	-	1	12	-	-	-	-
5736		Kiwoce	Kilimanj	-	-	-	-	0	16	0	8
5269		Decent	DSM	-	-	-	-	-	-	0	37

5738		Miesi	Mtwara	-	-	-	-	-	-	0	23
5968		Ndanda	DSM	-	-	-	-	-	-	8	78
5979		British	DSM	-	-	-	-	-	-	2	80
6120		Kingston	Singida	-	-	-	-	-	-	0	14
6121		Chisunga	Songwe	-	-	-	-	-	-	2	63
		Total		**28**	**586**	**54**	**715**	**11**	**165**	**27**	**535**

Source: Computed from NECTA results of 2018-2021

A limited number of Open school learners achieving divisions I—III (an average of less than 10% each year, as indicated by Table 1) prompted an investigation into whether these outcomes could be attributed to age, level of education and occupations as they vary among learners in Open secondary schools. Therefore, this study is limited to investigating the learners' perspectives regarding the potential effect of demographic factors (age, level of education, and occupation) on their performance in CSEE within open schools.

Hypotheses

Three hypotheses guided the study:

1. The age of the learners in open schools has an effect on their academic performance in the CSEE.
2. The educational level of learners in Open schools has an effect on their academic performance in the CSEE.
3. The occupational status of learners in open schools has an effect on their academic performance in the CSEE.

A Conceptual Framework

Figure 1 presents a conceptual framework that elucidates the influence of demographic factors on the academic performance of learners in NFSE within Open schools. This influence is moderated by learners' aspirations and modes of attendance. In this framework, demographic factors encompass learners' age, educational levels, and occupations, which are considered independent variables affecting academic performance in the CSEE, the dependent variable.

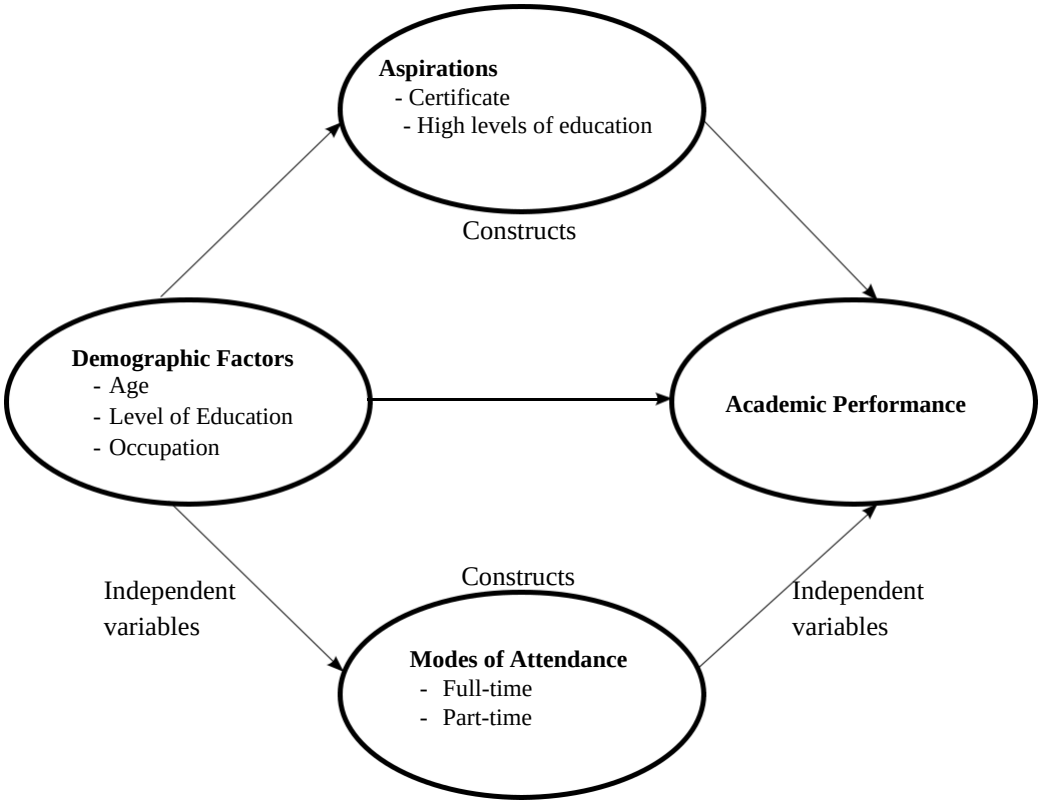

Figure 1. *Conceptual framework of the effect of demographic factors on academic performance*

Sources: Modified from Shatta and Shayo (2021)

Methods and Materials

This research is guided by the post-positivist paradigm, which asserts that universal truth and objective reality can be achieved through scientific methods that are testable, validated, and refutable. In order for research to be considered scientific, it must undergo observable and measurable processes (Cohen et al., 2018). Epistemologically, post-positivism views knowledge as statements, beliefs, or facts that can be empirically tested, confirmed, verified, or disproven and which are both stable and generalisable (Chillisa, 2012). In this study, the researchers employed appropriate data-gathering tools to ascertain the veracity of hypotheses concerning the effect of demographic factors on the academic performance of Open school learners in the CSEE within the Dar es Salaam region.

A quantitative research approach was employed for this study because of its appropriateness in determining the relationship between age, level of education, and occupations of learners in open secondary schools and their academic performance.

This relationship is obtained through computations and calculations of research findings, which could be achieved only through quantitative methods (Cohen et al., 2018). In addition, the approach allowed for the generalisation of the findings to all open secondary schools in the Dr es Salaam region. Although the quantitative research approach is criticised for relying heavily on statistical analysis to make generalisation that may not accurately represents the broader population (Erbacher, 2022), this criticism was overcome by not generalising the findings in a wider area (in all of Tanzania but in only Dar es Salaam region). The study adopted a cross-sectional research design because of its ability to reach a large sample with no preconceived or misconceptions about how the findings would turn out. Besides, the researchers desired to acquire standardised and quantifiable data from respondents using uniform questionnaires. This design facilitates the generalisation of results to the population (Gay et al., 2016; Cohen et al., 2018).

Study Area

The research was carried out in the Dar es Salaam region of Tanzania, chosen due to its record of hosting the highest number of registered Open secondary schools accredited by the Institute of Adult Education (IAE) compared to any other region in the country. As of March 2020, approximately 118 Open schools were registered in the region (IAE, 2020b), making it an ideal location for generalising findings on the effect of demographic factors on the academic performance of Open school learners in the CSEE.

The Study Population and the Sample

The study encompassed all Open secondary schools registered with the IAE and the learners in stage II, whether attending classes on a full-time or part-time basis in the Dar es Salaam region. Consequently, the sample included 30 (33%) Open schools out of the total of 91 and 454 (51%) learners out of 885. Within this sample, eight (27%) of the Open schools were owned by the IAE, while 22 (73%) were privately owned educational institutions, as indicated in Table 2. The selection of the sample schools was conducted using stratified sampling techniques, which involved dividing the schools into two categories based on ownership. The sample was then drawn proportionally from each subgroup using a simple random sampling. The number of schools within each subcategory was determined based on the percentage of Open schools in that subgroup.

Table 2

Population of Registered Open Secondary Schools in Dar es Salaam Region

School type	Registered	Active	Studied	Percentage
Owned by IAE	25	10	8	80
Owned privately	93	81	22	27
Total	118	91	30	33

Sources: Field data, 2022

To ensure a balanced allocation of respondents in each study site, the researchers employed a formula derived from the study's sample size, which was 51. The sample size for each study location was determined using the proportional formula developed by Fox et al. (2007), as indicated below (P = 51% and SE = 2.35).

$$N = \frac{P(100\% - P)}{(SE)2}$$

Whereas:

N = Required Sample size
P = Percentage of the sample size
SE = Standard Error of the Mean

A simple random sampling technique was used to select the category of learners in the sampled Open schools, as it offers the advantage of obtaining a representative sample from a defined population, with each member having an equal chance of inclusion (Gay et al., 2016). To carry out the sampling, each learner in the final year (stage II) of a particular Open school was assigned a folded piece of paper, inscribed as either "participate" or not to "participate". These pieces of paper were mixed in a container, and the number of papers labelled "participate" corresponded to the required sample size for that particular Open school. Each learner was instructed to take only one piece from the container. Those who chose papers marked "participate" were included as respondents in the study, while those who picked papers marked "not to participate" were excluded. Consequently, 149 (33%) respondents were from Open schools owned by IAE, and 305 (67%) respondents were from privately owned Open schools.

Data Analysis

The survey questionnaire, developed by the researchers, served as a primary instrument for data collection. A pilot study involving 23 learners was conducted to assess the questionnaires' clarity, the efficacy of the instructions, and the time required for completion. The internal consistency of the study instruments was evaluated using Cronbach's alpha coefficient (α), with the pilot study confirming the instruments' reliability at a level of α =.76. An alpha coefficient score of .7 or higher indicates instrument reliability (Cohen et al., 2018).

The questionnaires were utilised to gather responses from the respondents regarding

the perceived effect of their demographic factors on their academic performance in the CSEE. Respondents made selections based on the alternatives provided in the demographic data and four Likert scale questionnaires. The four Likert scale responses were used to enable the respondents to be on one side of either disagree or agree. Likert-scale questionnaires featured close-ended questions with numerical values assigned to facilitate quantitative data analysis. Data analysis was conducted using descriptive statistics with IBM SPSS 21 version and Partial Least Squares Structural Equation Modelling (PLS-SEM) with the assistance of Smart PLS 4 software.

Table 3

Interpretation of the Likert Scale

Range	Interpretation	Verbal interpretation	Weight
1.00 – 1.74	Strong Disagree	SD	1
1.75 – 2.49	Disagree	D	2
2.50 – 3.24	Agree	A	3
3.25 – 4.00	Strong Agree	SA	4

Source: Ann et al. (2017)

Results

Demographic information of respondents

Demographic information collected from the respondents in this study included age, level of education, and occupation. The analysis of this data revealed that the majority of respondents fell within the age range of 13 to 17, possessed a primary level of education and reported unemployment, as shown in Table 4 below. These findings signify that NFSE in Open schools accommodates individuals from diverse demographic backgrounds within a society.

Table 4

Demographic Information of Respondents in NFSE in Open Schools (N=454)

Information	Frequency	Percentage
Age		
13-17 years	254	55.9
18 + years	200	44.1
Level of education		
Primary	256	60.8
Secondary	178	39.2
Occupations		
Employed	15	3.3
Self-employed	25	5.5

Unemployed	414	91.2
Total	**454**	**100**

Sources: Field data, 2022

Learners' perceptions of the impact of demographic factors on academic performance

The findings revealed that respondents disagreed with the notion that older tend to achieve higher exam scores or that employed learners generally perform well. However, respondents agreed that younger learners exhibit greater dedication to their studies, employed learners typically have better access to study materials, unemployed learners are consistently diligent in their studies and perform well, and families with learners in Open schools provide substantial support for their learning. According to the data presented, the cumulative response score was 2.6, as shown in Table 5. This interpretation of the figure, based on the provided Likert scale, suggests that demographic factors among learners in NFSE within Open schools do indeed affect academic performance.

Table 5

Learners' Opinion on Demographic Factors as Determinant of Performance, N=454

SN	Statements	SD %	D %	A %	SA %	Mean	Interpretation
1	Older learners have high performance in exams.	24	29	33	14	2.38	Disagree
2	Young learners study hard and perform well	8	22	43	27	2.89	Agree
3	Employed learners do well in their exams.	17	28	32	23	2.61	Agree
4	Unemployed learners always study hard and perform well.	4	10	39	47	3.28	Agree
5	Learners who are employed perform well in exams.	25	29	28	18	2.39	Disagree
6	Families with learners in non-formal support them.	9	13	47	31	3.00	Agree
Grand average						2.60	Agree

Sources: Field data, 2022

The influence of demographic factors on learners' academic performance

The study incorporated moderators, namely learners' aspirations and modes of

attendance, as integral components in examining the impact of demographic factors on the academic performance of NFSE learners in Open schools. The hypotheses tested in the conceptual model were rooted in both the direct and indirect effects of demographic factors on academic performance. The findings demonstrated that the obtained probability values for both direct and indirect pathways exceeded the significance threshold (0.05), as summarised in Table 6. Consequently, the findings indicated that demographic factors among NFSE learners in Open schools were not statistically significant and, hence, did not significantly influence academic performance in the CSEE.

Table 6

Findings of Direct and Indirect Paths of Effects of Demographic Factors on Performance

Hypotheses	Path	Influence	P-Value	Remarks
H1	DMFPRM	Direct	0.233	Not supported
H2	DMF ASP PRM	Indirect	0.964	Not supported
H3	DMF MAT PRM	Indirect	0.107	Not supported

Sources: Field, 2022

Key:

DMF– Demographic factors
ASP – Aspirations
MAT- Modes of Attendance
PRM – Performance

To investigate the influence of demographic factors on academic performance among learners in Open schools, we employed Partial Least Squares (PLS-SEM) in conjunction with SMART PLS 4. The resulting report, displayed in Figure 2, reveals that demographic factors among learners had no direct impact on academic performance, being statistically insignificant, with a calculated P-value of 0.23, surpassing the significance threshold of 0.05. Also, when moderated by learners' aspirations, demographic factors continued to exhibit no effects on academic performance. They remained statistically insignificant, with a calculated P value of 0.96) exceeding the significance level of 0.05. Likewise, when moderated by modes of attendance, demographic factors were found not to influence learners' academic performance, remaining statistically insignificant, with an obtained P-value of 0.11 surpassing the significance level of 0.05. Additionally, individual demographic factors were observed to have no direct impact on academic performance, as depicted in Figure 2 below.

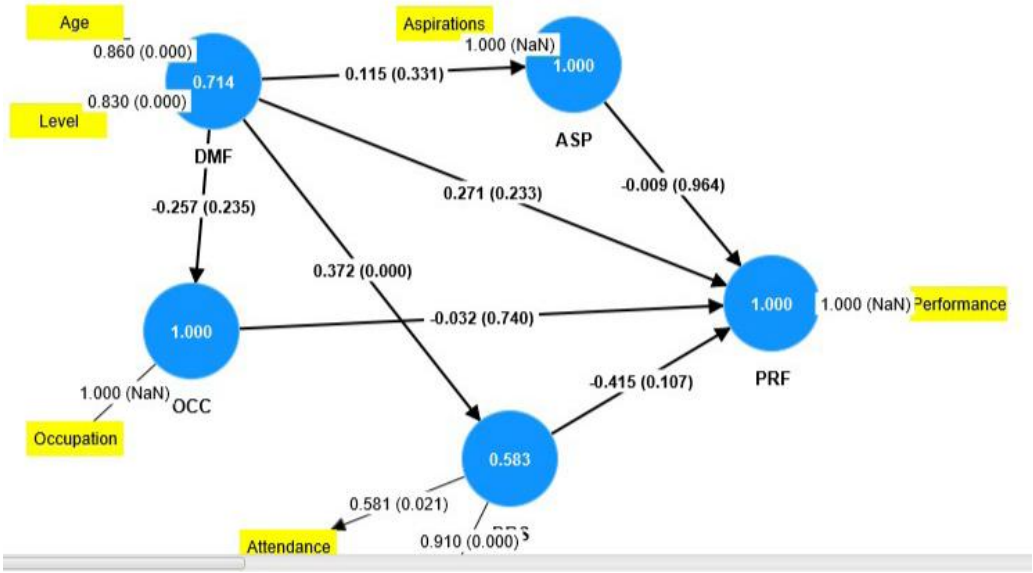

Figure 2. *The effect of demographic factors on academic performance*

Sources: Field data, 2022

Key: DMF = Demographic factors

PRF = Performance
OCC = Occupations
ASP = Aspirations

Discussion

The findings of this study indicate that demographic factors among learners in Open schools do not have a discernible impact on academic performance. This implies that characteristics such as age, educational level, and occupation do not appear to be the primary drivers of the significant variations in academic performance observed between learners in the formal education system and those in Open schools, as hypothesised. These results are comparable to the studies of Amuda, Balus and Joseph (2016) and Christopher and Redempta (2016), who found that the age of the learners does not have an effect on academic performance. Amuda et al. (2016) examined marital status and age as predictors of academic performance and found that age did not significantly predict academic performance. In the same vein, Christopher and Redempta (2016) investigated the influence of demographic factors among primary teacher trainees and found that age did not significantly predict academic performance ($F = 0.11$, $P = 0.897$, $P > 0.05$). As such, it becomes evident that other factors contribute to the differences in academic performance between two education systems (formal and non-formal).

The first hypothesis that the age of the learners in open schools has an effect on academic performance in the CSEE is rejected according to the research findings. However, this research finding is inconsistent with other studies in the literature, which revealed that age has a significant impact on learners' performance. For instance, Alhjrafi and Alasfour (2014), Zewude (2015), Luwes and James (2017), Amuda and Ali (2018) and Saaka, Attah and Shokwolo (2021) found that the age of learners has a significant impact on academic performance. The differences between some of these studies and the current study result from different factors such as the education system in which the study was conducted, the educational level of respondents, sample size, and the analysis techniques applied. The factors identified in some studies differ from those in this study. For instance, Alhjrafi and Alasfour (2014) conducted their research with undergraduate students in a formal education system, where learner age variation is minimal. In contrast, this study was conducted in a non-formal secondary education setting, where there is significant age variation among students. Alhjrafi and Alasfour also used a larger sample of 700 respondents, which helps minimise sampling error (Gill & Johnson, 2002), while our study employed a sample of 454 respondents.

Notably, the researchers used multiple linear regression analysis, which is limited to a simple model structure, processing observable variables only and considering that all variables are measured without error. In contrast, this study used Partial Least Square Structural Equation Modelling (PLS-SEM), which solves the limitations of multiple linear regressions (Hair Jr. et al., 2021). Likewise, Zewude (2015) investigated factors affecting Ethiopian learners' academic achievements and established a significant association between age and academic performance. Zewude's study differed from the present due to the context in which the research was conducted (University level), the sample size used (142 respondents) and the analysis technique, which was cross-tabulation with Chi-square test and binary logistic regression. Unlike the analysis technique (PLS-SEM) used in the current study, Cross-tabulation looks at the relationship between two nominal or ordinal variables without necessarily telling whether or not there is a relationship between variables (Muijs, 2004).

Amuda and Ali (2018) studied the relationship between study habits, age, and parents' level of education. Their findings showed that age had positive and statistically significant impacts ($r = .417$, $P = .005$, $P < 0.05$). These findings differed from this research due to the variations in sample size (142 respondents), an adaptation of research instruments from Carew and Hamman-Tukur (1989) and the analysis technique used, which was Pearson Product Moment correlation. Pearson correlation coefficient is restricted in that two variables are related to one another, but it does not mean that one causes the other. Moreover, Saaka et al. (2021) examined demographic factors as determinants of academic performance

among postgraduate students with a sample of 140 respondents. The analysis was performed using one-way ANOVA and an independent sample t-test. They found that the increase in age, the decrease in academic performance. Likewise, these findings differed from the current study because of the small sample size used, the level of education of the respondents and the data analysis technique, which is analysis of variance (ANOVA). ANOVA is used to compare means of more than two groups and can be affected by outliers (Muijs, 2004). In comparison, the current study used PLS-SEM, which enabled the researcher to estimate complex relationships among many dependent and independent variables, which ANOVA could not (Hair Jr. et al., 2021).

Similarly, the second hypothesis, which postulates that the educational level of learners in open schools has an effect on academic performance, is also rejected according to the research findings. This study agrees with Amuda and Ali (2018), who found that parental educational level has no significant relationship with students' academic performance ($r=.215$, $P = .171$, $P > 0.05$). But Bakar, Mamat and Ibrahim (2017) examined how parents' education and qualifications affected secondary school learners' performance, uncovering a positive correlation between parents' education level and academic performance at a significance level of .05. Bakar et al. (2017) findings contradict with this study because the earlier investigated the impact of parents' education level on their children performance in formal secondary education while this study examined the educational level of learners in non-formal secondary education in open schools.

The third hypothesis, which contends that the occupational of learners in open schools has an effect on academic performance, is rejected based on the study's findings. This result is opposed to Zewude (2015), who found the significant association with the socio-economic status of learners' families, including financial aspects and parents' education levels, was found to exert influence on academic achievement. Similarly, Yousefi (2010) found an association between family income and students' academic achievements. Zewude and Yousefi's findings differed from this study, as their research focused on learners' socio-economic backgrounds and family income, whereas this study examined the occupations of learners in non-formal secondary education within open schools.

It is vital to note that research on the effects of demographic factors on learners' academic performance has been relatively limited in the context of open schools, with the majority of such studies being conducted in formal secondary education. Open schools are a non- formal education system characterised by significant variations in learners' age, educational levels, and occupations, ranging from youths to adults, primary to secondary education levels, and employed, self-employed, and unemployed individuals.

Conclusion and Recommendations

The study sought to examine the demographic factors of open-school learners' academic performance. The study intended to test hypotheses on the relationship between age, level of education and occupations of learners in Open schools and their academic performance in the CSEE. In light of the confirmed study findings, the following conclusions are made:

i. The age of the learners in Open secondary schools has no effect on their academic performance in the CSEE.
ii. The level of education of learners in Open secondary schools has no effect on their academic performance in the CSEE.
iii. Occupations of learners in Open schools have no effect on their academic performance in the CSEE.

The principal finding of this study is that the learners' demographic factors do not significantly influence academic performance. The study, therefore, challenges conventional assumptions and underscores the need for a more nuanced understanding of the factors contributing to academic performance in open schools. Similarly, the results of this study offer practical implications for various stakeholders in NFSE as follows:

i. Government efforts should focus on promoting lifelong learning among individuals of various ages, educational backgrounds, and occupations to increase knowledge and skills.

ii. Improvements in facilities and resources used in Open schools should be prioritised, along with the expansion of this form of education system to accommodate individuals with diverse demographic profiles, hence increasing access to secondary education in the country.

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