



ORION
SCHOLAR JOURNALS



(RESEARCH ARTICLE)



Understanding training facilities and academic performance of trainees in pre-primary teacher training colleges in Kenya

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International Journal of Multidisciplinary Research Updates, 2023, 06(02), 008–020

Publication history: Received on 16 October 2023; revised on 29 November 2023; accepted on 02 December 2023

Article DOI: <https://doi.org/10.53430/ijmru.2023.6.2.0068>

Abstract

Early childhood education is the foundation of basic education in Kenya. However, the low academic performance of early childhood teacher trainees in Kenya has raised concerns among the education stakeholders. The study assessed the relationship between training facilities and academic performance among trainees in pre-primary teacher training colleges in Kisumu County. Constructivism Theory of learning was used to guide the study. The concurrent triangulation design. Target population was 23 registered pre-primary teacher training colleges in Kisumu County comprising of 1150 teacher trainees. Simple random, saturated and purposive sampling was used to obtain a sample size of 345 teacher trainees, 7 Sub county pre-primary coordinators, and 23 college programs officers respectively, making a sample size of 375. Questionnaire was used to collect data from teacher trainees, while interview schedule was used to collect data from programme officers and sub county pre-primary coordinators. Descriptive and inferential statistics were used to analyze quantitative data while thematic analysis was used to analyze qualitative data. Thus, it has been shown that availability of training facilities significantly influences academic performance of learners including pre-school teacher trainees. The study therefore recommends that both the national and county governments should put aside enough financial resources for revamping and furnishing the preschool colleges with the appropriate teaching facilities.

Keywords: Training facilities; Academic performance; Trainees; Pre-primary; Teacher training colleges; Kenya

1. Introduction

Teacher education has gained momentum in the contemporary society, thanks to the context of economic and social changes that make high quality schooling more important than ever before (Musset, 2010). Teacher education preparation in Kenya is done to meet the standards of teachers in the country and especially at pre-school level. Moreover, UNESCO-Southeast Asian Ministers of Education Organization (UNESCO-SEAMEO, 2015) assert that the quality of teacher education is a crucial factor for the success of education systems, since it is a necessary precondition for the quality of the education provided to learners. Evidence illustrates that improvements in program quality and child outcomes are often correlated with better educated and trained teachers (Behrman, 2013; Raikes, 2015). The United Nations Agenda (2030): Transforming our world contains the Sustainable Development Goals (SDGs) (United Nations, 2015), with SDG 4 being referred to as Education 2030. Therefore, training of the preschool teachers is essential for a country to achieve quality education in schools and the whole exercise or program takes a period of two years inclusive of teaching practice. However, in the recent past, the performance of pre-primary teacher trainees in national examinations administered by the Kenya National Examination Council (KNEC) has continued to remain low especially among the preschool colleges in Kisumu County as compared to the neighboring counties. Furthermore, Kisumu County had the highest number of trainees who did not meet the course requirement (38); trainees with referrals (108); and trainees who failed in the final examination (71). This level of performance therefore questions what might have affected the academic performance of teacher trainees among the pre-primary teacher training colleges in Kisumu County.

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Moreover, the performance of pre-primary teacher trainees in Kisumu County for the past 5 years remains low in diploma level. In all the years from 2017 to 2021 none of the students obtained distinction in Kisumu County. Over 50% of the graduates attained credit grades in 2017, 56% attained grade pass and above in 2018; 55% in 2019 obtained pass and above; in 2020 50% obtained pass and above; and in 2021 only 46% scored grade pass and above. The table also illustrates that 54% of the candidates were either referred, failed, or did not meet the course requirements in 2021. This therefore warrants the question of what the level of preparedness in terms of trainers' professionalism that is might affect the academic performance of the pre-school trainees in Kisumu County. According to Gopang (2016), improving the academic performance of students depends on improving training facilities, teaching, and learning resources and adherence to the learning environment as outlined by quality assurance guidelines. Although educational inputs like training facilities (Amsterdam, 2010), professionalism of trainers (Glewwe, Hanushek and Ravina, 2011; Hanushek, 2011), utilization of teaching and learning resources (Bizimana and Orodho, 2014) have been linked with sufficient delivery of training services among colleges for primary, secondary, and higher education teachers, Pre-Primary teachers training colleges seem to have been overlooked. Similarly, adherence to quality control guidelines among colleges has been assessed by researchers (Gudo, Olel & Oanda, 2011) with limited attention focusing on Pre-Primary teacher training colleges. It is against this backdrop that the present study seeks to assess the influence of trainers' professionalism on academic performance of trainee teachers in ECDE training centres in Kisumu County.

2. Theoretical Framework

This study was guided by the constructivism theory of learning as proposed by Jean Piaget (1970, cited in Pollard, 2006). According to Piaget, people learn through an interaction between thinking and experience, and through the sequential development of more complex structures. Piaget asserts that knowing is not a copy of reality. In constructivism, learners construct meaning from input by processing it through existing cognitive structures and then retaining it in long-term memory (Thomas & Brown, 2011). Constructivists view learning as depending on the degree to which learners can activate existing cognitive structures or construct new ones to subsume the new input (Alanazi, 2016). The theory by Piaget is supported by Bruner (1990) who come up with the idea that the goal of education should be intellectual development. His emphasis on discovery learning was also criticized as being inefficient. Piaget's critics include; John Holt (1998) who was famous for writing how children learn and how they fail. According to Garder (2000) people have intellectual capacity for example high performance in exams but have many kinds of intelligences including music, inter personal, spatial visual and linguistic intelligences. The differences in terms of training facilities, trainers' professionalism, teaching and learning materials and quality control may be a challenge to an educational system in terms of performance of the learners (Welberg, 1992) so trainees should be well prepared to acquire the necessary knowledge, skills and attitude during their training. Jean Piaget (1970) supports practitioners in providing plenty of expressive materials in learning to allow children to represent ideas in a verity of ways. This allows for iconic and symbolic thought. According to Bloom (1956) for learning to be successful, practitioners should develop and implement the set standards in training centres that is according to the order of complexity. Constructivists view learning as depending on the degree to which learners can activate existing cognitive structures or construct new ones to subsume the new input (Bartlett, 1932).

Constructivists aver that interaction between thinking and experience coupled by sequential development of more complex structures informs learning. According to Piaget (1970), encountering a new experience encompasses accommodation of existing to it as well as assimilating aspects of the new experience. Constructivism theory asserts that learners construct meaning from input by processing it through existing cognitive structures and then retaining it for a long time (Thomas & Brown, 2011). According to Alanazi (2016), by exploring play, innovation, and the cultivation of the imagination as cornerstones of learning, a vision of learning for the future that is achievable, scalable and one that grows along with the technology that fosters it and the people who engage with it is created. With positive attitudes of teachers towards teaching and learning, learning can be made more interesting and learners get more motivated. This can be achieved by using relevant examples which have applications in real life situations and organizing experiments to link theory to practice (Piaget, 1970). Additionally, there must be an agency (trainer) whose responsibility is to utilize the available resources under the supervision of the instructor for the attainment of the set goals (Bruner, 1980). Constructivist theory by Piaget was considered relevant in this study because contextual issues like training facilities must be sufficient with properly designed implementation process, adequate instructional supervision and appropriate teaching and learning materials in relation to the policy guidelines for pre-primary teacher education.

3. Literature review

Training facilities are relevant to effective learning and academic performance of student teachers. In support to this, Hallak (1990) identified facilities as the main contributing factors to academic achievement in the school system. The

quality of the school physical facilities has been found to be a major determinant of the school learning environment (Boakye- Boateng, 2015). In Minnesota, USA, Glewwe, Hanushek and Ravina (2011), study reported that the estimated impacts on time in school and learning of most school and teacher characteristics are statistically insignificant, especially when the evidence is limited to the —high quality studies. The few variables that do have significant effects such as availability of desks, teacher knowledge of the subjects they teach, and teacher absence. Suleman and Hussain (2014) study in Pakistan revealed that classroom favorable facilities have a significant positive effect on the academic achievement scores of secondary school students. The students of the experimental group showed better performance as compared to the students of control group. Similarly, Raja and Wei (2014) in Pakistan found that computer knowledge and skills have been imparted in the trainees, but their effectiveness could have been increased if rigorous training need analysis had been done. The study also found that availability of physical facilities in the colleges influenced the effectiveness of training. Arshad, Haq and Khan (2020) showed that public schools had more physical facilities as compared to PEF partner schools. The annual result of Punjab Examination Commission (PEC) was taken as an achievement of students. The performance of public schools is better regarding students' achievement as compared to PEF partner schools. Amsterdam (2010) study in South Africa revealed the state of sanitation facilities, littering and vandalism; lack of safe and inviting spaces in which to play and socialize and lack of sport equipment and facilities among students. Educators shared the concern of students about the poor state of sanitation facilities and lack of sport equipment and facilities. In addition, educators expressed concern about overcrowding and a wish for computers in order to expose students to modern day technology.

In Nigeria, Akomolafe (2016) showed that there was a significant relationship between physical facilities and students' level of motivation and academic performance. Similarly, Rufai, Umar and Idris (2013) conclude that implementation of curriculum of Technical and Vocational Education for effective teaching and learning to take place in TVE institutions cannot be achieved without adequate provision of facilities to cater for the teeming number of students in TVE institutions in Nigeria. The availability and maintenance of school facilities will enhance teaching and learning and improve TVE students' academic performance and the acquisition of practical skills for gainful employment in industries or related organizations, so that they can contribute to the development of their immediate society and the nation at large. Asaju (2012) study in Nigeria showed that 99.4% of respondents agreed with a Cumulative Mean of 2.9 that availability and adequacy of infrastructure is important to quality education delivery. 91.9% of the respondents are of the opinion that inadequate funding, lack of periodic monitoring and regular maintenance of infrastructure is responsible for the prevalent infrastructural decay in secondary schools. Results from the checklist showed that available infrastructures, though inadequate lack quality and are not regularly maintained. Mfreke (2016) study in Nigeria revealed that there exists significant positive relationship between teachers' utilization of school facilities (library, laboratory, information, and communication technology (ICT) center and recreation center) and academic achievement of student nurses in Human Biology.

Issah, Abubakari and Wuptiga (2016) study in Ghana revealed significant relationships between school facilities and teacher academic stress, and that status of school facilities influence teacher job stress significantly. Locally, Mokaya (2013) found that improved academic achievement is associated with more adequate and well-spaced classrooms, adequate and ample spacing in the libraries, adequate science laboratories, adequate water and sanitation facilities and adequate participation in co-curricular activities. Chepkonga (2017) study in Kenya found out that there was significant relationship between learning facilities and provision of quality Pre-Primary in West Pokot County. Majority of public Pre-Primary teacher training centres in West Pokot County were found not to have enough classes, desks, water, kitchen stores among others. Lack of adequate learning facilities negatively influenced the provision of quality education. However, the results revealed that the students showed that availability of training facilities support quality academic performance in various sectors of education. Ojuok, Gogo and Olel (2020) revealed that the three variables, science laboratory, quality classroom and computer laboratory (which are components of physical facilities) had weak but significant relationship with student performance in KCSE.

3.1 The Present Study

The present study sought to establish the relationship between training facilities used and academic performance among trainees in pre-primary teacher training colleges in Kisumu County.

3.2 Research Hypothesis

The study tested the following null hypothesis:

Ho: There is no significant relationship between training facilities used and academic performance among trainees in pre-primary teacher training colleges in Kisumu County.

4. Methods

4.1 Research Design

The study adopted concurrent triangulation design of a mixed method approach (Creswell, Plano & Clark, 2003). In this design the researcher collects and analyses quantitative and qualitative data separately on the same phenomenon and then the different results are converged by comparing the different results. The researcher used only one data collection phase during which quantitative and qualitative data were collected separately yet concurrently. The findings were integrated during the interpretation phase of the study. Equal priority was given to both data collection methods (Creswell, 2013). The intent in using this design was to bring together the differing strengths and non-overlapping weaknesses of quantitative methods with those of qualitative methods (Creswell et al, 2011). Qualitative designs tend to collect open-ended data without predetermined responses while quantitative usually collect closed ended responses such as found on questionnaire such as psychological instruments (Lewis, Saunders and Thornhill, 2007).

The researcher therefore used questionnaire, interviews, and document analysis guide to obtain both quantitative and qualitative related to preparation program of teacher trainees towards academic achievement. During data collection, questionnaire were given to teacher trainees while, program officers and the sub county coordinator for early childhood were interviewed Dean of curriculum provided relevant documents for analysis inform of guide to collect recorded information related to study variables such as training facilities, qualification of trainers, available teaching and learning resources, availability of other records like assessment records, evaluation, accreditation according to the policy guidelines on 2018 and records of performance of teacher trainees for the last five years. The design was appropriate for this study because the study directly compared quantitative statistical results from questionnaires with qualitative findings from interviews and document analysis guide.

4.2 Study Participants

The study targeted 1150 second year teacher trainees, 23 trainee program officers and 7 Sub County Coordinators. The sample size of the study comprises 345 second year pre-school teacher trainees, being 30% of 1,150, 23 college programme officers and 7 sub county pre- primary coordinators giving a total of 375 respondents and informants. Table 8 presents the distribution of the sample size. The percentage of sample size was appropriate because when the percentage of the population is higher the higher chance of validity is reached. For qualitative data, interviews were conducted with 23 program officers and 7 sub county pre-primary coordinators education officers in-charge of ECDE provided records to gather information about preparedness of trainees. For qualitative research, Mason (2010) suggests 10-30 participants of the entire population was enough to give the amount of useful information hence quality of data.

4.3 Research Tools

The research tools involve operationalizing the research design into instruments of data collection with a view to collecting data to meet research objectives (Mugenda & Mugenda, 2008). The study combined both quantitative and qualitative techniques of data collection. A combination of both techniques was preferred because they complement each other. Primary data was generated through designed Likert scale questionnaires for second year pre-primary teacher trainees, interview schedule for college programme officers and sub county coordinators for ECDE. Document analysis guide or college programme officers helped to analyse recorded information related to training in the pre-primary teacher education colleges.

4.4 Data Analysis

This study collected and analyzed both qualitative and quantitative data. Quantitative data from the questionnaire was analyzed using both descriptive and inferential statistics by the help of SPSS version 23.0. According to Wolveto (2009), descriptive analysis involves a process of analyzing data through mean, standard deviation, frequency counts and percentages, while inferential statistics is concerned with making predictions or inferences about a population (Nachmias & Guerrero, 2008), of which in the present study, regression analysis was used to assess the relationship between the variables as well as for testing of the study hypotheses. In addition, qualitative data was analyzed thematically.

5. Findings and discussions

The study sought to establish the relationship between training facilities used and the academic performance of trainee teachers in ECDE training centres. The respondents' views on training facilities was captured using 9 items measured on a 5-point Likert scale rated as strongly disagree (SD) = 1, disagree (D) = 2, Undecided (UD) = 3, agree (A) = 4 and Strongly Agree (SA) = 5. The results were analyzed to show frequency, percentages, mean and standard deviation as presented in Table 1.

Table 1 Training Facilities and Academic Performance

Training Facilities	SA	A	UD	D	SD	Mean STD	
	5	4	3	2	1		
I feel comfortable in spacious classrooms.	36	165	4	48	31	3.44	1.22
	12.7%	58.1%	1.4%	16.9%	10.9%		
I like the college kitchen because it is well kept.	28	142	63	24	27	3.42	1.08
	9.9%	50.0%	22.2%	8.5%	9.5%		
I feel safe and secured while using the college playground.	24	119	60	57	24	3.22	1.11
	8.5%	41.9%	21.1%	20.1%	8.5%		
The latrines in the colleges are enough and clean.	32	140	15	74	23	3.29	1.20
	11.3%	49.3%	5.3%	26.1%	8.1%		
Computer lab is well equipped with ICT gargets.	11	92	25	103	53	2.67	1.21
	3.9%	32.4%	8.8%	36.3%	18.7%		
Dormitories have enough bedding for all the students.	16	101	61	79	27	3.00	1.11
	5.6%	35.6%	21.5%	27.8%	9.5%		
I feel that college library is equipped with relevant materials	17	128	27	61	51	2.99	1.27
	6.0%	45.1%	9.5%	21.5%	18.0%		
There are enough water supplies within the college.	56	169	21	25	13	3.81	1.00
	19.7%	59.5%	7.4%	8.8%	4.6%		
Electricity used in college is reliable.	61	178	19	19	7	3.94	0.87
	21.5%	62.7%	6.7%	6.7%	2.5%		
Overall Mean						3.31	1.12

Source: Survey Data, 2021

Table 1 illustrates that, on average, the sampled teacher trainees were generally undecided ($M=3.31$; $STD= 1.12$). This seems to suggest that while training facilities might be sufficient and capable of enhancing the academic performance of trainees in some colleges, the same was contrary in other institutions. Indeed, the large standard deviation ($STD=1.12$) illustrates that there is minimal concurrence regarding preparedness in terms of training facilities among the pre-school teacher training colleges. Based on the tenets of the constructivism theory context, where learning takes place is critical for the acquisition of desired knowledge (Thomas & Brown, 2011), it can be concluded that learning may not be taking place in some of these colleges at their optimum levels. Indeed, some authors (Alanazi, 2016; Taber, (2019) have previously stated that learning is a process of knowledge construction aided by tools which include training facilities such as classrooms, laboratories, and libraries among others. Supporters of constructivism has argued that learning, being an inherently social activity, is suitable in an environment with sufficient facilities so as to enable desired interaction between the learner and such facilities (Jaleel & Verghis, 2015). Such facilities enable learners to activate existing cognitive structures or construct new ones to subsume the new input (Alanazi, 2016).

From the results in Table 1, it emerged that the teacher trainees moderately feel comfortable in spacious classrooms. This was indicated by the item mean ($Mean = 3.45$; $STD = 1.22$). In this case, the majority of the participants (58.1%) agreed that they feel comfortable in spacious classrooms with another 12.7% of them strongly agreeing. However, only 16.9% of the participants disagreed with a further 10.9% strongly disagreeing with the statement while 1.4% was neutral. In general, while most of the participants (70.8%) agreed that they feel comfortable in spacious classrooms, some 29.2% others denied that the classrooms were comfortable and spacious. This shows that not all trainees have spacious classrooms even though teacher trainees require comfortable and spacious classrooms to enable them to perform well. The importance of spacious classrooms also featured quite clearly during the interview sessions with the College Programs officers, where one of them raised a concern about congested learning environment and yet spacious classrooms were important. In his own words he said;

“Currently we are intending to admit more trainees and at this rate we are at the verge of overcrowding the classroom, which may as well hurt quality of learning. To maximize learning potential, classrooms should be open, comfortable, well lit, and visually stimulating. Strategic use of existing space can make a big difference, too.”..... (CPO, 3).

Another SCC said,

“The training facilities like classrooms are inadequate due to the introduction of the new curriculum requires enough space as it involves practical that requires enough area for participation forcing some institutions to use other facilities like churches, secondary or primary schools to offer services”.....(SCC, 2).

The statement attributed to CPO 3 and SCC 2 tends to suggest that classroom environment is a significant factor in the academic achievement of the teacher trainees in the pre-school training colleges. This tends to concur with an earlier study by Suleman and Hussain (2014) which examined the effects of classroom physical facilities on the academic achievement scores of secondary school students in Kohat Division, Pakistan. These authors revealed that classroom favorable facilities have a significant positive effect on the academic achievement scores of secondary school students. In another similar finding, Malik and Rizvi (2018) also found that classroom environment is a significant predictor of student outcome. Further, two studies conducted in Nigeria (Adesua, 2014; Akomolafe and Adesua, 2015) also concluded that classroom environment is an important motivating factor capable of marring or enhancing teaching and learning process. Therefore, the success of pre-school teacher training colleges in ensuring better academic performance of teacher trainees significantly relies on the classroom environment.

Similarly, whereas some of the participants tended to agree that they like the college kitchen because it is well kept ($Mean = 3.42$; $STD = 1.09$), some did not like their kitchen. This was shown by the fact that although the majority of the participants (59.9%) agreed, 18% of them disagreed with the statement that they like the college kitchen because it is well kept and 22.2% were undecided. This shows the skewed distribution of attitude of teacher trainees towards the college kitchen.

Another CPO said,

“Actually the kitchen is well kept even though some of the workers are not well trained so they need to be reminded on so many things that is making me to be overworked”..... (CPO,4).

Another SCC said,

“I like neat kitchen because it can lead to a healthy life as the trainees will not get sick due to germs from the kitchen.....”(SCC,1).

From the results of the discussion, it seems that participants like well-kept kitchens because everyone enjoys being in a clean environment. The findings agree with Chepkonga (2017) in Kenya who found out that there was a significant relationship between learning facilities like clean kitchen environment on learning outcome. The study also revealed that lack of adequate facilities negatively influences provision of quality education. The findings concur with Emiliana (2017) in Parkistan who found out that learning facilities including safe kitchen have a positive influence on academic outcome of the learners. This implies that teachers' colleges should be encouraged to keep high standards of cleanliness of the kitchen.

Equally, it emerged that the teacher trainees only moderately feel safe and secured while using the college playground ($Mean = 3.22$; $STD = 1.11$). The mean rating showed that the participants were generally undecided. Although many

(41.9%) of the participants agreed, 20.1% others disagreed while 21.1% were undecided. This shows that a significant proportion of teacher trainees do not feel safe and secure when using the playground. Similarly, during the interview session with the College program Officers, it was established that most of the preschool training colleges do not have safe playing ground for teacher training and this made most of the trainees' fear expressing themselves freely during playing or games. One of the college program officers had this to say;

"Some of the playgrounds are not very safe and fit for certain activities because some are bushy due to poor maintenance, some have obstacles like stones, potholes, heaps of soil making the ground not properly leveled.....". (CPO 6).

Another SCC said,

"It is good to have safe play ground which is well maintained and spacious to accommodate the trainees during activities areas, leisure and even during competition....."(SCC, 6)

From the forgoing discussion, it emerged that the majority of the participants agreed with the fact that they feel safe and secure while using the college play ground. This finding concurs with Akomolafe (2016) in Nigeria whose finding indicated that motivation and security of playground influence academic performance of teacher trainees. The findings also agree with Amstadam (2010) in South Africa who explored perception of students on school infrastructure. It emerged that lack of space in the playground limits the student's academic achievements. This implies that learners should be provided with enough space and security in the playground.

Similar results emerged regarding the statement on whether the latrines in the colleges are enough and clean. (*Mean = 3.29; STD = 1.2*). In this case, although 49.3% of the participants agreed and another 11.3% strongly agreed that the latrines in the colleges are enough and clean, more than a quarter (26.1%) of them disagreed and a further 8.1% of them strongly disagreed. Thus, 60.6% of participants cumulatively agreed while 34.2% cumulatively disagreed with the statement. This shows that while in some colleges, the latrines are enough and clean for the teacher trainees, this is not true in a significant proportion of the colleges.

Another CPO said,

"Latrines and toilets are enough and well-kept since the college employed workers who work in the lavatories to ensure that they are ever clean".....(CPO, 10).

One SCC said,

"even though the latrines and toilets are well kept, in some institutions only one person is employed to work in both male and female latrines making them uncomfortable with the opposite sex".....(SCC, 5).

From the above discussion, it is evident that most of the participants agree that latrines in the college are enough and clean to serve everybody within the college. The findings agree with Chepkonga (2017) in Kenya who investigated the influence of learning facilities on provision of quality education. The results showed that facilities like classes, kitchen and latrines support quality education. In addition, the findings agreed with Mfreke (2016) in Nigeria who examined the relationship between teacher utilization of school facilities and academic achievement of students' nurses. The findings reveal that there is a relationship between infrastructure and academic achievement of the students. The implication of these findings is that the stakeholders should be sensitized on the importance of enough and clean latrines so that students can feel comfortable in the training.

On computer labs, the results show that the computer labs were not well equipped. This was shown by the response rating of 2.66 (*STD = 1.21*) on the item regarding the statement that the "Computer lab is well equipped with ICT gadgets like desktops, projectors and tablets". In this case, the view of the participants was divergent across 5 response levels. However, most participants (36.3% disagree; 18.7% strongly disagree) cumulatively (55.0%) disagreed that their computer lab is well equipped with ICT gadgets. On the other hand, only 32.4% of participants agreed that their computer lab is well equipped with ICT gadgets. The results indicate that the computer labs are not well equipped to facilitate good academic performance among teacher trainees. This was confirmed by qualitative data from interviews with the sub county coordinator of ECDE where it emerged that most of the ECDE training colleges had inadequate computer equipment like lap tops, desk top and projectors.

For instance, in one of the interviews with Sub County Coordinators of ECDE, one participant had this to say:

“In our sub county most of the ECDE teacher training centres have poorly equipped computer laboratories affecting meaningful teaching and learning thus hindering academic performance.....” (SCC, 1)

Another CPO said,

“Our computer laboratories are not well equipped with the necessary gadgets that the new curriculum (CBC) require this is due to lack of funds to source for the gadgets”(CPO, 20).

From the forgoing discussion, it is evident that the majority of the participants disagreed with the idea that the computer laboratory is well equipped with ICT gargets such as projectors, lap tops, desk tops and tablets. Enough computer gargets enable students' learners to learn faster and without scrambling for the few gargets. The finding agrees with Raja and Wei (2014) in Parkistan who explored the effectiveness of teacher training programme on the use of information and computer technology training. The study found out that computer knowledge and skills imparted and availability of physical facilities in colleges influence the effectiveness of the training. In contrast, a study by Gossenhrimer, Bem, Carneiro and De Castro (2017) in Portugal who compared performance of campus-based students and distance learning students. The study found better performance in distance education mode. This implies that computer technology in learning is more effective than face to face learning.

Likewise, dormitories were found to be moderately adequate for teacher trainees. This was shown by a mean response rating of 3.00 ($STD = 1.11$) on the statement that dormitories have enough bedding for all the students. This shows that participants had views across the response continuum. For example, 35.6% of participants agreed with the statement, 5.6% strongly agreeing that dormitories have enough bedding for all the students, but 27.8% of participants disagreed while 9.5% strongly disagreed with it and another 21.5% of them being undecided. Cumulatively, 41.2% of participants agreed, 37.3% disagreed while 21.5% were undecided on the statement that dormitories have enough bedding for all the students. This implies that there was not enough bedding for all teacher trainees in many of the colleges.

One of the CPO said,

“The institution do not provide all the bedding's because some of the trainees prefer residing outside the college while others live within the college”....(CPO, 9).

One SCC said,

“Since the college admits students who are considered to be adults, they are allowed to stay within or outside the college for those who want privacy”(SCC, 3).

From the findings above, it was noted that a high number of participants showed that dormitories have enough bedding for all the boarding students. This enables the students to sleep well and concentrate during the day in their studies. The findings concur with Amstadam (2010) in South Africa who studied on the views and experiences of educators and students in relation to infrastructure. The study noted a significant relationship between dormitories, sanitation and littering on academic achievement. The study was in contrast by Rufai, Umar and Idris (2013) in Nigeria who found no significant relationship between beddings in the dormitories in technical vocational education and academic achievement.

Similarly, the results showed that college trainee teachers do not feel that the college library is equipped with relevant materials. This emerged as revealed from the item mean response rating of 2.99 ($STD = 1.27$), where only 45.1% of the participants agreed and 6.0% strongly agreed that their college library is equipped with relevant materials. On the other hand, 21.5% of participants disagreed while 18.0% strongly disagreed that their college library is equipped with relevant materials and a further 9.5% of them remained undecided. Cumulatively, 51.1% of participants agreed while 39.5% disagreed. This shows that most of the college libraries are not fully equipped with relevant materials in nearly 40% of the cases, yet lack of relevant materials affects the academic performance of teacher trainees.

This was further corroborated by the qualitative data from Sub County coordinator of ECDE, where it emerged that most of the preschool colleges in the sub county had poorly serviced libraries, yet library relates positively with the learning outcome. For instance, in one of the interview sessions, one participant had this to say:

“Quality learning outcome and use of school libraries directly relate to each other. Libraries are greatly valued repositories that offer teacher trainees with reliable information, study skills and reading space, yet not much of them have been valued and they face several challenges in charging services. poor funding, lack of a library policy, poor ICT infrastructure, poor library facilities, and lack of awareness of the importance of school libraries”..... (SCC, 3).

Another CPO said,

“Most teacher trainees would wish to do their private studies in the library because they feel that when they are in the library, they can access a lot of information that enables them to acquire knowledge”(CPO, 8).

From the above discussion, it is evident that most of the participants feel that the college library is well equipped with the relevant materials that enable them to learn during their free time and to do more research using the library. The finding agrees with Mfereke (2016) whose finding revealed that there was a significant positive relationship between utilization of training facilities like library and laboratory on academic achievement. The study is in contrast with Mokaya (2013) in Kenya who reported that library equipment did not predict academic achievement. It is worth noting that this finding is consistent with Gopang (2016) in Parkistan who showed that there is a relationship between library and academic achievement. This implies that training colleges should be equipped with relevant materials, especially the library to make learning easy.

Equally, in terms of availability and adequacy of utilities, the participants generally agreed that there are enough water supplies within the college. This finding was suggested from the fact that, whereas majority (79.2%) of the participants either agreed or strongly agreed, as reflected a mean rating of 3.81 ($STD=1.00$), another 13.4% of participants disagreed and 7.4% of them were noncommittal on the matter.

One CPO said,

“There is enough water supply since the college have storage tanks and borehole making water to flow throughout in college”.....(CPO, 2)

Another SCC said,

“Water is very essential and available though some were not fit for consumption because it was noted that some of the storage tanks were not properly maintained and water from the borehole was not treated”.....(SCC, 4).

From the discussion above, the majority of participants showed that there exists enough water supply in the colleges, making it essential and life so its availability makes life easy in the colleges. The findings concur with Chepkonga (2017) in Kenya that availability of water supply in pre-primary teacher training centres support quality academic performance of teacher trainees. This implies that all teacher training centres should have enough water supply or use in the colleges.

Similarly, although electricity was found to be available, it was reliable. This was reflected by a mean response rating of 3.94 ($STD = 0.87$) on the item that sought to establish whether electricity used in college is reliable. Although the view that it was available as shown by the standard deviation of less than one (1.0), some 6.7% of the participants were undecided that electricity used in their college is reliable and 6.7% of participants disagreed while 2.5% strongly disagreed that electricity used in their college is reliable. This shows that although electricity in more than 80% of the colleges is available. Availability and reliability of electricity facilitates learning most of the times allowing for better academic performance.

One CPO said,

“Electricity reliable even though due to weather conditions like heavy rains the power goes off but is backed up by solar energy”.....(CPO,2).

Another SCC said,

“Electricity is available but it was noted that some sockets are dangerous to the students since they have open wires”.....(SCC, 2)

The findings of the study indicate that most of the participants agreed with the statement that electricity used is reliable. Electricity helps trainees to study well at night and to use computer gadgets. The study agreed with Suleman and Hussain (2014) in Parkistan that classroom and electricity have a significant effect on academic achievement. The findings agreed with Akungu (2014) in Kenya who examined the influence of teacher resources like electricity and found that inadequacy of electricity have a negative impact on the academic achievement of the learners.

The findings provide evidence that although physical facilities such as libraries, laboratories and playground are important resources that signify the level of preparedness of an institution to enhance student academic performance, they are not adequate in many of the colleges. These findings had also been articulated in earlier research reports such as Arshad, Haq & Khan (2020), Comfort and Veronica (2016), Onyebuenyi et al (2022), as well as Ojuok et al (2020). Learning institutions with adequate physical facilities such libraries, laboratories, classrooms, and playgrounds among others were noted in these studies to be performing better than those without. Pre-school training colleges therefore stand a better chance of ensuring improved performance among teacher trainees with adequate training facilities.

5.1 Relationship between Training Facilities and Academic Performance

To determine the relationship between training facilities used and academic performance of pre-school teacher trainees, the researcher carried out a correlations analysis. Table 2 presents the results of the correlations between training facilities used and academic performance of pre-school teacher trainees.

Table 2 Correlation between Training Facilities used and Academic Performance

		Training Facilities Used	Academic Performance
Training Facilities Used	Pearson Correlation	1	0.290**
	Sig. (2-tailed)		0.000
	N	284	284
Academic Performance	Pearson Correlation	0.290**	1
	Sig. (2-tailed)	0.000	
	N	284	284

Table 2 shows that the correlation between training facilities and academic performance of teacher trainees is positive and significant ($n=284$; $r=.290$; $p < 0.05$). The null hypothesis that “*there is no significant relationship between training facilities and academic performance among trainees in pre-primary teacher training colleges in Kisumu County*” was therefore rejected. Thus, it has been shown that availability of training facilities significantly influences academic performance of learners including pre-school teacher trainees. This finding seems to resonate with the tenets of the constructivism theory which allude to the fact that a learner’s knowledge acquisition is a function of the context, or the environment among others (Biswas, 2018). Training facilities in the teacher trainee’s environment is a significant determinant of the trainee’s academic performance.

The significance in the relationship between training facilities and academic performance of pre-school teacher trainees seems to reflect earlier studies which also came up with similar findings albeit in different contexts. For instance, Mfreke (2016), in a study done in Nigeria to examine the relationship between teachers’ utilization of school facilities and academic achievement of student nurses in Human Biology in schools of Nursing, found that there exists significant positive relationship between teachers’ utilization of school facilities (library, laboratory, information and communication technology (ICT) center and recreation center) and academic achievement. Similarly, Mokaya (2013) found that improved academic achievement is associated with more adequate and well-spaced classrooms, adequate and ample spacing in the libraries, adequate science laboratories, adequate water and sanitation facilities in a study which analyzed the impact of school infrastructure on the provision of quality education in public secondary schools in Kajiado County (Kenya).

To determine the actual influence of availability of training facilities and academic performance of pre-school teacher trainees, a regression analysis was computed. Table 3 presents the output of model summary of regression analysis.

Table 3 Regression Model Summary of Training Facilities and Academic Performance

Model	R	R Square	Adjusted R Square	Std. Error of the estimate
1	0.290 ^a	0.084	0.081	10.79546

Dependent Variable: Academic Performance; Predictor: (Constant), Training Facilities

Table 3 shows Adjusted *R* Square of .081, implying that preparedness in relation to availability of training facilities explains 8.1% variations in pre-school teacher trainee performance. In other words, pre-school training college preparedness component of availability of training facilities accounts for 8.1% of variability in performance of pre-school teacher trainees. This indicates that one of the significant determinants of pre-school teacher trainee performance is the availability of training facilities. The study further sought to determine whether the model $Y = a + b_1 X_1 + e$ was fit and significant to predict the relationship between availability of training facilities and academic performance of pre-school teacher trainees. This led to computation of regression ANOVA analysis. The analysis is as presented in Table 4.

Table 4 ANOVA Analysis for Training Facilities and Academic Performance

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3028.234	1	3028.234	25.984	0.000 ^b
	Residual	32864.838	282	116.542		
	Total	35893.072	283			

a. Dependent Variable: Academic Performance; b. Predictors: (Constant), Training Facilities

Table 4 show statistics to ascertain whether the model is fit to show the relationship between training facilities and academic performance of pre-school teacher trainees. The results show $F(1, 282) = 25.984$ with p -value = 0.00. Since p -value was found to be less than 0.05 level of significant, there was therefore adequate evidence to conclude that preparedness in terms of availability of training facilities is a significant predictor of pre-school teacher trainee academic performance.

The study further sought to establish how a unit of preparedness in terms of availability of training facilities leads to changes in academic performance of teacher trainees. To this end, unstandardized beta coefficient analysis was run, and the results were presented in Table 5.

Table 5 Coefficients Analysis for Availability of Training Facilities and Academic Performance of Teacher Trainees

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	32.425	3.685		8.799	0.000	25.171	39.679
	Training Facilities	5.189	1.018	0.290	5.097	0.000	3.185	7.192

a. Dependent Variable: Academic Performance

Table 5 shows that an improvement in preparedness by one unit in terms of creation of availability of training facilities leads to an increase of 5.189 within CI (3.185, 7.192) units in pre-school teachers’ academic performance. Based on p -value of 0.00 as shown on Table 5, this increase was found to be significant since its p -value was less than 0.05 level of significant and a t -value $5.097 > 1.96$. If this statistic is substituted in the above model, the approximated model $Y = a + b_1 X_1$ would be $Y = 32.425 + 5.189X$ where X represent the measure of preparedness in terms of availability of training resources.

6. Conclusion and Recommendation

From the findings, the study concludes that; classrooms of significant number of pre-primary school colleges in Kisumu County were not spacious enough to make trainee teachers learn comfortably. From the study findings that many ECDE training centres do not have adequate training facilities, it is concluded that appropriate physical facilities such as playing ground, latrines, computer laboratories and dormitories are not adequately prepared, serviced or furnished to facilitate effective learning of the preschool teacher trainees. It was therefore concluded that college libraries are not adequately equipped with relevant materials. From the study findings, it was concluded that most of the preschool colleges in Kisumu County are ill prepared in terms of teaching facilities to enhance effective learning and good academic performance among the trainees. However, from the finding that availability of training facilities is positively correlated to academic performance among the ECDE trainees, and that it is a significant predictor to academic performance of the ECDE trainees, it is concluded that availability and use of training facilities is important in enhancing academic performance. The study therefore recommends that both the national and county governments should put aside enough financial resources for revamping and furnishing the preschool colleges with the appropriate teaching facilities such as playing ground, latrines, computer laboratories and dormitories to enhance good academic performance.

Compliance with ethical standards

Acknowledgments

We would like to thank the staff at the National Cancer Institute in Wad Medani for their help and support as well as our colleagues at the department of human nutrition. Our thanks are extended to all participants in this study.

Disclosure of conflict of interest

All authors have no conflict of interest.

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