Original Article

An Assessment of the Availability and Accessibility of Teaching and Learning Resources in Kindergartens in Ghana

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ABSTRACT

Using the resource dependency theory, the study assessed the availability and accessibility of teaching and learning resources (TLRs) in kindergarten classrooms in Ghana. The participants included 191 public school kindergarten (KG) teachers from two regions of Ghana. The researchers developed the Teaching and Learning Resources Questionnaire specifically for the study. The questionnaire comprised two subscales: availability and accessibility. Each subscale comprised six categories: literacy, language, and numeracy development, gross motor development, fine motor development, creative and artistic expression, ICT and digital learning, and play and exploration. The highest percentage of teachers indicated they always or most of the time had classroom displays, flashcards, and reading books available. The lowest percentage of TLRs that were most of the time or always accessible were toys appropriate for the age group and electronic devices as ICT tools. Regarding the categories of TLRs, the highest mean scores for both the availability and accessibility subscales were in the creative and artistic expression category, followed by literacy, language, and numeracy development. Alternatively, the lowest mean scores for availability and accessibility were in the ICT and digital learning tools category. The study contributes to the broader efforts of offering equitable and effective educational experiences for all children.

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INTRODUCTION

Early childhood is a critical period of human development as it lays the foundation for cognitive, emotional, and social development, influencing an individual's lifelong course. During these years, the brain experiences rapid changes, making it an important time for learning vital skills such as language, problem-solving, and emotional regulation. Quality childhood experiences, in the home or formal education contexts, promote curiosity, resilience, social competence, executive functioning, and motivation, all of which contribute to success in later schooling and adulthood (Bendini, & Devercelli, 2022). Moreover, investments in early childhood education have been shown to yield significant societal benefits, including improved economic outcomes (Bendini, & Devercelli, 2022). These early interventions are particularly crucial for disadvantaged children, helping to bridge opportunity gaps and promote equity.

Overview of Kindergarten Education in Ghana

Early childhood education (ECE) has made significant gains in Ghana, particularly since it was recognized as the foundation of education. In Ghana, ECE comprises creches, daycares, nurseries, and kindergartens, however, only kindergarten (4–5 years) education is compulsory for all children. The government added kindergarten education to the formal basic education system (Ghana Education Service, 2024; Wolf, 2019) in 2007. Early childhood education is private and public, with the latter funded by the government. The main aim of kindergarten education in Ghana is to develop literate individuals, good problem-solvers who can think creatively and have the confidence and competence to participate fully in Ghanaian society as responsible local and global citizens (Ministry of Education [MOE], 2019).

The 2019 standards-based national curriculum framework, developed by the National Council for Curriculum and Assessment (NaCCA), focuses on play-based and child-centred learning, emphasizing that children acquire the six important skills in language and literacy namely; phonemic awareness, the concept of print, alphabetic knowledge and phonics, vocabulary, comprehension, and fluency) which are required for effective oral and written communication, digital literacy, and psychosocial skills for a smooth transition to later education. The curriculum also includes local culture and traditions to make learning more relevant and accessible to children. Teachers are encouraged to use play and active learning approaches within a print-rich learning environment using child-friendly instructional materials that support children's holistic development (MOE, 2019).

Availability and Accessibility of Teaching and Learning Resources

The availability of instructional materials in an ECE setting is a quality indicator for parents and other stakeholders. Play materials such as toy cars, bicycles, and tricycles have been found to promote the development of fine and gross motor skills in children (Bamezor *et al*., 2021). Teachers use teaching and learning materials to introduce new concepts, reinforce learning, encourage creativity, and promote socio-emotional development (Abebe, & Keery, 2023).

A recent study by Partey *et al*. (2024) determined that the extent of educational resource deprivation among basic schools in Ghana had decreased from 45.1 % in 2015–2016 to 35.4 % in 2018–2019, with higher regional disparities. The findings further revealed that the incidence of deprivation has also decreased from the highest 83.6 % to the lowest 77.9 %. In comparison, the intensity of the deprivation in Ghanaian basic schools has changed from 49.6 % to 46.7 %, with the northern

part of the country, especially the Brong Ahafo Region, having the highest levels of deprivation. A 2022 study in the Volta Region of Ghana exploring the availability of instructional resources in early childhood settings reported a complete absence of or inadequate instructional resources in some ECE settings (Dzakadzie, & Agbayisah, 2022). Materials such as story and picture books and educational games such as bingo, seesaw, merry-go-round, swings, skipping ropes, marbles, blocks, Cuisenaire rods, toys, and puzzles were identified as completely absent in the centres. Although available in the district, other instructional materials such as alphabet cards, clay and sand for modelling, flashcards, and bottle tops were either unavailable in some schools or were inadequate. Adequate indoor and outdoor spaces were noted in the school (Dzakadzie, & Agbayisah, 2022). In contrast, a recent study in Ethiopia revealed that almost all teaching-learning materials were available in selected preschools. The availability of the resources was attributed to funds provided by an independent organization (Abebe, & Keery, 2023).

In the Ga-West municipality in the Greater Accra Region of Ghana, Frimpong (2019) explored the state of the classroom environment of the ECE centres to understand their role as the "third teacher." The finding revealed that the availability of resources in the classrooms varied. For instance, attractive pictures and drawings (56.1%) and learning centres (68.4%) were available. The study further reported that although learning centres were present in some schools, the teachers and learners did not utilize them (Frimpong, 2019). The centres were either covered or dusty, implying that the learning centres were not accessible to the teachers and the children. This situation implied that children in those schools did not get the opportunity to touch, arrange, and rearrange objects to help them understand concepts (Bodrova, & Leong, 2024).

The availability of resources depends on geographical location and school type. Private schools in urban centres have more resources than public centres in urban areas. Public centres in rural settings have the least resources (Frimpong, 2019). In addition to geographical locations, socioeconomic, and cultural conditions account for the disparities in rural-urban early childhood education (Anlimachie, 2015). Thompson (2019) argued that children's sociocultural and local backgrounds influence how teachers teach students. For instance, teachers use culturally relevant materials, traditional stories, and rhymes to promote literacy and language skills in the kindergarten context. Teachers in urban settings used traditional songs as a context to support children's language learning. In rural schools, teachers use similar songs to integrate children's learning with their life experiences. Thus, there is a need to incorporate aspects and features of local socio-cultural contexts into the pedagogy, thereby connecting children's learning experiences with local contexts (Thompson, 2019).

Ghanaian kindergartens (like those in other sub-Saharan African countries) face significant challenges concerning the availability and accessibility of educational resources (Mkhize *et al.*, 2023). For example, Ackah-Jnr (2018) noted that due to factors such as eco-political and school factors, not all schools attract the necessary resources, and some schools attract more resources while others have limited or no resources. Resource-rich environments lead to better learning outcomes, facilitating diverse and engaging educational experiences (Hill, & Hannafin, 2001). Resources such as books, educational toys, technological tools, and didactic materials are all vital for promoting active learning, creativity, and critical thinking in young learners (Fox, & Schirrmacher, 2014; Roche, 2014). Uneven distribution, inadequate maintenance, and a lack of teacher training in resource utilization exacerbate the problem, impacting the quality of education provided (Bamezor *et al.,* 2021). It should be noted that an effective, safe, and stimulating learning environment does not necessarily have to be complex or expensive (Bendini, & Devercelli, 2022). Thus, schools need creative and innovative ways to manage the challenge of making teaching

and learning resources available and accessible to learners.

Purpose of the Study

The availability and accessibility of TLRs to learners is a vital component of developmentally appropriate early childhood education (Papadakis *et al*., 2018). After the start of the kindergarten curriculum in 2019 (MOE, 2019), very few studies have examined the availability and accessibility of TLRs for the kindergarten learning environment in Ghana. Additionally, it is unclear to what extent TLRs are equitably distributed among the various learning areas of the kindergarten curriculum. Furthermore, studies on the availability and accessibility of TLRs in the use of appropriate pedagogical approaches are scarce. Therefore, the current study assessed the availability and accessibility of teaching and learning resources (TLRs) in kindergarten classrooms in Ghana. The study provides insights into the current state of TLRs, informing teaching practices and curriculum development (Akyeampong, 2017).

Research Questions

The study sought to answer the following questions:

- To what extent are teaching and learning resources available in kindergarten classrooms in Ghana?

- To what extent are teaching and learning resources accessible to kindergarten teachers in Ghana?

THEORETICAL FRAMEWORK

The study utilized the theoretical framework of the resource dependency theory (RDT) (Pfeffer, & Salancik, 1978). RDT states that organizations rely on external bodies for resources to function effectively and that organizations are not self-sufficient because the needed resources are controlled by other entities (Pfeffer, & Salancik, 1978). Applying this principle in school settings, priority is often given to certain subjects or teaching methods that require fewer resources or

curricula are adapted to fit the available materials (Cobbold, 2017). A second feature of RDT is that an organization can adjust to changes in external environmental conditions (Drees, & Heugens, 2013). Changes in educational policies, for example, would require new curricular materials and professional development training for teachers. Furthermore, RDT sheds light on the relationship between public schools and the resource providers—national government agencies, district/municipal/metropolitan assemblies, non-governmental organizations, and international funding agencies. This type of relationship implies reliance on external funding, which could result in the provision of materials that are not suitable or relevant to the needs of a school (Takyi *et al*., 2021). An organization's dependence on external funding could also contribute to the disparity between urban and rural schools in terms of providing teaching and learning resources (Akyeampong *et al*., 2007).

The RDT's strengths include its focus on the external environment's impact on organizational operations (Hillman *et al*., 2009), the provision of insights into environmental uncertainty (Casciaro, & Piskorski, 2005), and the ability to adapt it to different types of contexts (Davis, & Cobb, 2010). The RDT has its limitations. They include the overemphasis on external control of resources, the de-emphasis on organizational agency (Casciaro, & Piskorski, 2005), and the disregard for socioeconomic issues in sourcing teaching and learning materials (Hillman *et al*., 2009). Notwithstanding these weaknesses, the RDT provides a framework for understanding resource acquisitions for schools and their implications for teaching and learning.

MATERIALS AND METHODS

Participants

The study utilized a convenience sample of 191 (84.29% female and 15.71% male) public school kindergarten (KG) teachers from the Central and Upper West Regions of Ghana. The participants were 83 KG 1 and 108 KG 2 teachers with teaching experiences of 0.5–38 years (M = 8.85).

We used a convenience sample because it is inexpensive, as this study is not funded.

Instrument

The Teaching and Learning Resources Questionnaire (TLRQ) served as the data collection tool. The TLRQ consists of three parts. The research team developed the questionnaire based on the new Ghanaian kindergarten curriculum (MOE, 2019). Part I consists of 12 items that examine the availability of teaching and learning resources (TLRs) in kindergarten teachers' environments (indoor and outdoor). For this questionnaire, availability means that teaching and learning resources are present in the learning environment (indoor and outdoor).

Part II examined the accessibility of the 12 teaching and learning resources (TLRs) (listed in Part I) in the kindergarten learning environment (indoor and outdoor). For this questionnaire, accessibility means teachers and children can easily obtain the TLRs. Part III elicited participants' demographic information, such as certification, educational/professional qualification, participants' sex, teaching experience, class size, school type (public or private), and location of the school (district and region).

The TLRQ is a 4-point Likert scale of Always (4), Most of the time (3), Somewhat (2), and Rarely (1), consisting of two subscales: Availability and Accessibility. Each of the subscales consisted of six categories (comprised of the same items for both subscales): literacy, language, and numeracy development, gross motor skills development, fine motor skills development, creative and artistic expression, ICT and digital learning, and play and exploration. The availability and accessibility subscales had Cronbach Alphas of .890 and .830, respectively.

The Institutional Review Board at the first author's institution approved the study. We obtained written permission from the District, Municipal, and Metropolitan Directors of Education to conduct the research in their schools. Next, teachers who participated in the study provided written consent before completing the questionnaire. Participants were informed that their participation was voluntary and that they could withdraw from the study at any time by discontinuing completion of the questionnaire.

Data Analysis

Data were analyzed using descriptive statistics. First, we calculated the frequencies and percentages of teachers who indicated "Always," "Most of the time," "Somewhat," and "Rarely" for each item on the questionnaire. Second, we combined the frequencies and percentages for the "Always," and "Most of the time" responses. Similarly, we combined the frequencies and percentages of the responses for "Somewhat" and "Rarely" for each item. Only the combined frequencies and percentages for "Always" and "Most of the time" for each item were reported in the results section (See Table 1). Third, the questionnaire items were organized under six categories, and the mean was computed for each category. The items were categorized based on curriculum core content integration (content standards) (MOE, 2019). Finally, the categories were ranked based on mean scores (See Table 2).

RESULTS

Availability and Accessibility of Individual TLR Items

Table 1 represents data for the availability of individual TLR items. The results show that the highest percentage of teachers that indicated they always or most of the time had TLRs available were flashcards (75.92%) and classroom displays (75.92%), followed by reading books (60.73%). In contrast, the TLRs with the lowest percentage of teachers indicating they were always or most of the time available are toys appropriate for the children's age group (35.08%), followed by electronic devices as ICT tools (43.98%) and indoor gross motor play areas (43.98%).

The highest percentage of TLRs that were most of the time or always accessible were flashcards (79.58%), classroom displays (78.53%), and learning centres (61.26%), followed by

worksheets (59.16%). However, the lowest percentage for TLRs always or most of the time accessible to teachers was toys appropriate for the children's age group (31.41%), followed by indoor motor play areas (39.79%) and electronic devices as ICT tools (43.46%).

Table 1: Frequencies and Percentages for TLR Items

Variables	Availability	Accessibility
	(Always/Most Times) f/%	**(Always/Most Times)** f/%
Literacy. Language, and Numeracy Development		
Reading (learner's) books.	116 (60.73%)	106 (55.50%)
Worksheets	110 (57.59%)	104 (59.16%)
Flashcards, sentence cards, word cards, picture cards, etc.	145 (75.92%)	152 (79.58%)
Gross Motor Skills Development		
Indoor gross motor play area.	84 (43.98%)	76 (39.79%)
Outdoor gross motor play area	104 (54.45%)	103 (53.93%)
Fine Motor Skills Development		
Indoor fine motor play area.	100 (52.36%)	102 (53.40%)
Outdoor fine motor play area.	91 (47.64%)	98 (51.31%)
Creative and Artistic Expression		
Classroom displays.	145 (75.92%)	150 (78.53%)
Art materials	111 (58.12%)	109 (57.07%)
ICT and Digital Learning Tools		
Electronic devices as ICT tools.	84 (43.98%)	83 (43.46%)
Play and Exploration		
Toys appropriate for the children's age group.	67 (35.08%)	60 (31.41%)
Learning Centers	112 (58.64%)	117 (61.26%)

Availability and Accessibility of TLR Categories

Table 2 shows the means and rankings for the TLR categories for the availability and accessibility subscales of the TLRQ. The highest mean score for the availability of TLRs was in the creative and artistic expression (2.84) category, followed by literacy, language, and numeracy development (2.79). Alternatively, the lowest mean score for availability was in the ICT and digital learning category (2.23). The highest mean score for the accessibility of TLRs was in the creative and artistic expression (2.95) category, followed by literacy, language, and numeracy development (2.85). Conversely, the lowest mean score for accessibility was in the ICT and digital learning category (2.26), followed by play and exploration (2.37).

The creative and artistic expression category ranked first in both the availability and accessibility of TLRs, followed by literacy, language, and numeracy development (second). Conversely, ICT and digital learning tools ranked the lowest (sixth) in availability and accessibility. The gross motor skills development category ranked third on the availability subscale, but fourth on the accessibility subscale. Additionally, the play and exploration category ranked fourth on the availability subscale, but fifth on the accessibility subscale. Furthermore, the fine motor skills development category ranked fifth on the availability subscale and third on the accessibility subscale.

Table 2: Mean Scores and Ranks for TLR Categories

Variables	Availability		Accessibility	
	Mean	Rank	Mean	Rank
Literacy, Language, and Numeracy Development	2.79	2nd	2.85	2nd
Gross Motor Skills Development	2.45	3rd	2.42	4th
Fine Motor Skills Development	2.36	5th	2.48	3rd
Creative and Artistic Expression	2.84	1st t	2.95	1st
ICT and Digital Learning Tools	2.23	6th	2.26	6th
Play and Exploration	2.37	4th	2.37	5th

DISCUSSION

Utilizing the theoretical framework of the resource dependency theory, this study assessed the availability and accessibility of teaching and learning resources in kindergarten classrooms in Ghana. In this section, we present four major findings. First, the highest percentage of TLRs that were "most of the time" or "always" available and accessible in kindergarten classrooms were flashcards, classroom displays, and reading books. Flashcards, typically used for teaching literacy and numeracy, are easy to create with minimal cost (Burchinal *et al*., 2022). Classroom displays are other forms of resources common in kindergarten classrooms (Wambui *et al*., 2023). Displays can be in various forms, such as posters, charts, and drawings on manila cards. These findings are consistent with Sheu, & Ijaiya (2017), who reported that wall charts were available in all the schools they studied. One reason reading books was readily available could be because kindergartens emphasize literacy development in early grades. Another reason could be that the provision of reading books in schools is cost-effective because books are often used for several years by different groups of students. This is consistent with the findings of Bendera *et al*. (2022), who reported that books were available and adequate in their study of primary schools in Kenya.

Second, the lowest percentage of TLRs that were "most of the time" or "always" available or accessible in classrooms were toys appropriate for the age groups, electronic devices as ICT tools, and indoor gross motor play areas. The scarcity of these TLRs in Ghanaian kindergarten classrooms can be attributed to financial constraints and their perceived educational value. This is consistent with the finding that age-appropriate toys were lacking in schools (Aina, & Bipath, 2022; Frimpong, 2021). However, Simiyu, & Wanjala (2020) reported in their study that toys were available but insufficient or inaccessible. In contrast, Murundu *et al*. (2014) reported that 80% of the Kenyan teachers they studied integrated motor play into their teaching. Moreover, the availability and accessibility of play materials such as age-appropriate toys in kindergarten settings are critical as they promote the development of fine and gross motor skills in children (Bamezor *et al*., 2021). Furthermore, research shows significant positive relationships between the availability and accessibility of toys and teaching effectiveness (Odu, & Upula, 2016) and teachers' job performance (Sheu, & Ijaiya, 2017).

Electronic devices such as ICT tools are scarce in kindergartens due to their cost. The unavailability of ICT tools is also due to the lack of infrastructure in the schools. This is consistent with previous studies regarding the lack of television sets, DVDs, and cartoon CDs in early childhood classrooms in Kwara State, Nigeria (Sheu, & Ijaiya, 2017). Teachers' limited knowledge of the use of technology could be another reason for the unavailability and accessibility of ICT tools as teaching and learning tools. This finding is consistent with that of Ogegbo, & Aina (2020), who reported that a sample of South African early childhood teachers lacked practical training in the use of technology for young children. Often, there are inadequate spaces in many Ghanaian classrooms, which is another factor for the insufficient indoor gross

motor play areas—many kindergarten classrooms are overcrowded.

Third, data on the ranking of the categories revealed disparities in the availability and accessibility of TLRs—creative and artistic expression and literacy, language, and numeracy development were the categories with the most available and accessible TLRs. This is consistent with the assertion that Ghanaian parents believe early childhood education should prepare children for school readiness (Kabay *et al*., 2017). In their study, Sofo *et al*. (2019) assessed the enacted curriculum of a group of Ghanaian kindergarten teachers. Their findings indicated that the teachers focused mainly on "academics"—literacy, numeracy, and environmental studies.

Fourth, the ICT and digital learning tools category had the least available and accessible TLRs, ranking sixth out of six categories. The next lowest-ranked category of TLRs available in kindergarten classrooms was the fine motor skills development category, comprising the indoor and outdoor fine motor play areas. With the increase in technology integration in teaching, ICT tools have become important resources to enhance teaching and learning (Selwyn, 2011).

Additionally, the fifth-ranked category to have TLRs accessible was the play and exploration category. Obuchere *et al*. (2014) reported that most early childhood education teachers in their study did not know how to integrate play activities into their teaching. Abebe, & Keery (2023) examined the availability and utilization of play materials in a model preschool in Ethiopia. Their results indicated that most preschool classrooms did not have indoor play areas.

The present study has two main limitations. First, the sample was drawn from only two of the sixteen administrative regions of the country. Second, the teachers self-reported the availability and accessibility of TLRs in their classrooms. Therefore, future researchers should utilize a study sample that will reflect the views of kindergarten teachers in the country. Additionally, future research should use participant or non-participant observations to determine the availability and accessibility of TLRs in kindergartens in the country. Finally, we suggest future research examine the mediating or moderating role of the availability and accessibility of TLRs on kindergarten teachers' instructional practices.

CONCLUSIONS

Based on the results of the current study, the following conclusions can be drawn. First, the TLRs that were the most available and accessible in the kindergarten classrooms were those that focused on teaching literacy and numeracy. These included flashcards, classroom displays, and reading books. Second, the least available and accessible TLRs included toys appropriate for the age groups, electronic devices as ICT tools, and indoor gross motor play areas. The study contributes to the broader dialogue on offering a foundation for future initiatives that ensure equitable and effective educational experiences for all children in Ghana (Arkorful *et al*., 2019).

Recommendations

Based on the findings of this study, there is a need for District, Municipal, and Metropolitan Assemblies to actively involve their respective communities in generating funds to provide TLRs for play-based teaching and technology integration. For example, parent-teacher associations and not-for-profit organizations could play key roles in generating funds to purchase TLRs for schools. The Ghanaian kindergarten curriculum expects teachers to be trained on awareness of pedagogies such as play-based learning and the use of technology. Therefore, we recommend indigenous TLRs in kindergarten classrooms in Ghana to enhance the relevance and cultural appropriateness of the education provided (Addo, Adu, 2022; Takyi *et al*., 2021). Local fabrics could be used for arts and crafts activities (Addo, & Adu, 2022). Similarly, clay, stones, discarded bottles, and cans could be used for pottery, counting, and sorting learning experiences.

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