



Availability and use of infrastructural resources in promoting quality early childhood care and education in registered early childhood development centres

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Background: Quality early childhood development (ECD) is crucial for protecting children against a multitude of socio-economic challenges such as poor living standards, lack of education, and substandard healthcare. Furthermore, research has revealed that educational resources used at ECD centres enrich the all-round well-being of young children. Despite these findings, the provision of educational resources in the ECD learning environment has received little or no attention at national and local levels.

Aim: This study aimed to explore registered ECD centres to understand the available infrastructure resources and how they are used to promote quality early childhood care and education (ECCE).

Setting: A sample of eight participants (four ECD centre principals and four practitioners) from four registered ECD centres were purposively selected in suburban and township areas of Pretoria, Gauteng, South Africa.

Methods: An interpretative, qualitative multiple case study was used and the Woodhead quality framework for ECD centres was used as a guide for this study. Data were collected through face-to-face semi-structured interviews, non-participant observation and field notes.

Results: The findings revealed that practitioners know how the use of learning resources improve young children's growth and development. However, the township centres have fewer infrastructure resources that promote quality ECCE because of the dire socio-economic conditions of the parents.

Conclusion: The lack of modern and age-appropriate play equipment at township registered centres indicated that the (township) practitioners are not able to use such equipment, even though they are aware of their benefits in promoting quality ECCE. Hence, quality ECCE is not equally available. The great equaliser, called ECCE, is merely a smokescreen.

Keywords: infrastructural resources; registered early childhood development centres; quality early childhood care; education; suburban centre; township centre.

Introduction

Education infrastructural resources are essential structures and facilities needed to carry out teaching and learning activities including care in early childhood development (ECD) centres. Education infrastructure includes: spacious and well-ventilated classrooms, playgrounds, equipment, basic utilities such as water and electricity and game equipment; the aforementioned are considered to be key elements in a child's holistic growth (Akash 2018). Infrastructure resources that should provide a safe environment conducive for learning are also identified as significant tools in offering quality early childhood care and education (ECCE) (Department of Social Development [DSD] & EPRI 2014; Department of Social Services and Poverty Alleviation, Department of Education & Department of Health 2005). As infrastructure is recognised as an essential tool in offering quality care and learning, it is essential to describe the infrastructure available in ECD centres and to understand how the infrastructural resources are used to promote quality ECCE.

Note: Special Collection: Early Childhood Development in Theory and Practice.

The provision of quality care and education has been identified as one of the goals in the new United Nations (UN) Sustainable Development Goals (SDGs). Quality ECD is crucial to protect children against a multitude of socio-economic challenges such as poor living standards, lack of education and sub-standard healthcare (Van der Gaag & Putcha 2015). A significant body of research has identified quality ECCE as being fundamental to improving health, academic levels, opportunities for future employment and for eradication of poverty and inequalities (Moore, Quassaunee & Sherretz 2019; Richter & Samuels 2018). In addition, research has revealed that educational resources used at ECD centres enrich the all-round well-being of young children (Berris & Miller 2011; Cooper 2015). The availability of facilities, infrastructure and resources is described as an important variable in achieving quality education (Chepkonga 2017). A well-resourced ECD centre is essential if ECD is to cascade into tackling social exclusion (Richter & Samuels 2018). To achieve the benefits of ECCE, the availability and speedy delivery of necessary resources for their judicious use at ECD centres are paramount. Despite these findings, the provision of educational resources in the ECD learning environment has received little or no attention at the national and local levels in terms of policy guidelines, regulations, equality and delivery of much-needed resources (Cooper 2015).

Governments across the globe should concentrate on developing appropriate strategies to ensure that educational resources are evenly and expeditiously delivered to facilitate access to quality ECCE. Kotzé (2015) stated that ECD centres require massive financial, human and infrastructural assistance to improve the quality of ECCE. In South African context because of insufficient funding, the ECD centres and services for children (from birth up to 4 years) lack human and material resources at the regional, provincial and local or district level for international understanding (Richter et al. 2017). This hinders the building of new and much-needed ECD centres that meet the criteria stipulated by the departments of social welfare, education and health. Hence, it becomes difficult to access quality ECD education for young children who are already disadvantaged by the legacy of apartheid, which exacerbates their vulnerability (Atmore 2019; Atmore, Van Niekerk & Ashley-Cooper 2012; Van Heerden 2012). Polcyn and Gawrysiak (2017:88) added that 'school resources are limited by the funds available to a given school'. Hence, this study sought to explore and understand the availability and use of infrastructural resources in ECD centres in Pretoria, South Africa.

The Children's Act 38 of 2005 (Children's Act 38 of 2005 2018) stipulated that ECD centres must be licensed to operate in the Republic of South Africa (RSA) to ensure high standards of service delivery. Before registration and subsidy may be considered, ECD centres must comply with partial facility and ECD programme requirements and guidelines (Atmore 2019). The National Norms and Standards and Regulations Compliance include aspects such as quality physical infrastructure, appropriate learning materials, and sound

management. There is an indication that some resources are available at registered ECD centres. However, the national norms and standards do not prescribe how the available resources should be used to promote quality ECCE. Therefore, the purpose of this study is to explore and understand the availability and use of infrastructural resources to promote quality education in registered ECD centres in Pretoria, South Africa. The main research question explored in this study is 'What does the use of infrastructural resources in registered ECD centres in Pretoria reveal about the quality ECCE in South Africa?' The sub-research questions to achieve this exploration include: (1) What are the available infrastructural resources in registered ECD centres in Pretoria? (2) How does the use of infrastructural resources in registered ECD centres in Pretoria promote quality ECCE?

Literature review

Quality in early childhood development centres

There has been much scholarly debate on how to give an appropriate description of quality service delivery at ECD centres (Bonetti & Brown 2018; Smith et al. 2000). Quality in ECD services is generally addressed by examining two commonly accepted components, namely structure and process (Bonetti & Brown 2018). According to the South African ECD policy documents and guidelines, quality ECCE is mainly determined by the presence of structural and process quality inputs such as 'physical infrastructure, the number of toilets and washbasins, the learning programme, group size, teacher-child ratio, the presence of developmentally appropriate education equipment, materials and resources, governance and financial management' (Atmore 2019:29). Both structural and process components are essential inputs at the ECD centres that determine quality service delivery. However, it is generally recognised that quality ECD is crucial to improve the cognitive, health and socio-emotional development of young children (Paulsell et al. 2010). This indicates that the structural and process inputs at ECD centres should be used in a way which improves young children's holistic growth and development to enhance quality ECCE. It is also important not to overlook the nutrition, safety and health conditions of the children as quality indicators in ECD centres.

Infrastructure facility, health and safety condition in early childhood development centres

Young children learn effectively when they feel safe and secure. Earthman (2004) described important elements related to safety and health as potable water, fire safety, adequate toilets, security systems and effective means of communication during emergencies. In addition, the DSD (2011) highlighted the importance of regular adult supervision, washable and hygienic floors, availability of safety protection in case of fire or other accidental hazards as essential to providing quality care. As a result, Barrett et al. (2019) advised that investment in school infrastructure

should not be seen as a luxury but as essential. Correspondingly, authors such as Atmore (2013) and the Human Sciences Research Council (HSRC) (2009) revealed that in South Africa, ECD centre infrastructure is an issue because many ECD centres lack proper infrastructure, preventing them from being registered and posing a health and safety danger to the children they care for. This indicates that children at some unregistered ECD centres are open to health and safety risks as a result of infrastructure challenges, which also disqualified them from being registered with the DSD. However, this study seeks to explore the availability of infrastructure in registered ECD centres; perhaps something different will be detected regarding health and safety.

Regarding the description of infrastructural resources in the ECD centres, the National Norms and Standards in the *Children's Amendment Act* No. 41 Section 79(2) describes infrastructural resources at an ECD centre as the comfortable environment – inside and outside of the premises, suitable equipment and sound physical structure of the building (RSA 2007). The specific requirements for infrastructural resources are as follows (RSA 2007):

- safety procedures and equipment must be installed in case of emergencies such as fires, accidents and hazards
- adequate space, light and ventilation and demarcated spaces for different activities and functions
- a consistent supply of safe drinking water available for all children
- hygienic and adequate sanitary facilities such as cleaning detergents, basins and toilets for children and staff
- each child under the age of three should have his or her own potty, which is properly cleaned after each use
- for children over the age of three, there must be one washbasin and one toilet for every 20 children
- a hygienic area for food preparation, cooking, serving and storage
- adequate storage containers, cooling facilities and cleaning agents.

The description of infrastructural resources is part of the requirements according to the national norms and standards that need to be upheld in outdoor and indoor environments to qualify for official registration of an ECD centre with the DSD (RSA 2007). The document on national norms and standards although gives details of what is required at the ECD centres in terms of infrastructure resources, but it does not indicate how the resources should be used to promote quality ECCE.

Several authors have recognised infrastructural resources at the ECD centres such as the buildings, space, lighting and ventilation and learning equipment as structural quality inputs (Bonetti & Brown 2018; Peisner-Feinberg & Yazejian 2010). Chopra (2016:54), in his study on quality early childhood education for underprivileged children in a municipal area of Delhi, discovered that schools with higher components of structural quality exhibited an 'indicator of good quality', meaning that such schools have access to clean

drinking water, toilets, safety and hazard equipment and measures, a clean physical environment, sufficient classroom seating space, moving about and enacting activities, appropriate teacher storage rooms and ample outdoor playroom space.

According to Dearing, McCartney and Taylor (2009), research has shown that ECCE learning environments in terms of design, layout and space can influence a child's learning, creativity, behaviour and cultural interest. Thus, policymakers should provide guidelines for space and size per activity. For example, the Indian quality standards for ECCE provide a square-metre-unit indication for classrooms and outdoor spaces, including spaces for cooking and eating snacks. Profeta (2012) recommended that a good physical arrangement should comprise the ideal space that allows the practitioner to observe children's learning activities without distraction across areas of activity; it must be a useful, comfortable and safe setting for both children and adults, as well as one that encourages and facilitates full freedom for children with sensory and motor difficulties. Gashaw (2014:41) added that 'children need and love high mobility activities such as sliding, climbing, gardening, spraying, crawling, balancing, riding and running in playgrounds' and he emphasised on the safety of the play area and suggested that rubber-matting is advisable to prevent accidents, especially around equipment and stairs. This indicates that ECD centres should have infrastructural resources that allow young children space for growth, movement and development.

Use of infrastructural resources in early childhood development centres

Whilst several authors have identified the benefits of infrastructure in promoting quality teaching and learning, it might be difficult to pinpoint the use of physical infrastructure such as buildings and other physical facilities. For example, Chukwbikem (2014) identified three fundamental roles for infrastructural resources in ECCE, namely promoting the attainment of successful outcomes, creating and sustaining a system to support elements of quality and ensuring continuous quality improvement through mechanisms of accountability. Similarly, Abraham (2012) stated that the education programme for any level can only be successfully realised with quality infrastructure; broken-down infrastructure is directly proportional to a broken-down system and subsequently a broken-down educational system. On the other hand, Chopra (2016) indicated that infrastructure such as access to clean drinking water, toilets, safety and hazard equipment and measures, a clean physical environment, sufficient classroom seating space and ample outdoor playroom space is an indicator of good quality ECD centres. However, these studies did not indicate how these infrastructural resources are used; as a result, the present study seeks to explore how the use of infrastructural resources promote quality learning, for example, the use of physical equipment. Knowledge of the use of resources in ECD centres will not only benefit the ECD practitioners who

work with the young children but will also aid the relevant stakeholders (such as policymakers, parents and community members) in recognising their required contribution to improving learning outcomes for the young children.

Challenges faced by early childhood development centres in South Africa regarding infrastructure resources

The National Norms and Standards Policy requires that ECD centres should have quality infrastructure, which ensures a safe, healthy learning environment for children (Mbarathi, Mthembu & Diga 2016; RSA 2007). However, the literature (Atmore 2013) has revealed a dire situation regarding ECD centres' infrastructural resources in South Africa as it was discovered that several ECD centres were functioning:

[w]ithout basic infrastructure such as running water, access to electricity, suitable sanitation, secure fencing around the premises, and food is prepared in the same area in which children spend the majority of their. (Atmore, 2013, p, 156)

Which leads to poor quality of the ECCE. However, the data collection instrument used in Atmore's (2013) research was only document analysis such as dissecting the South African Government ECD Implementation Policy and Programme Reports using more than one data collection instrument enhances the quality and authenticity of research findings (Denzin & Lincoln 2018). This implies that using only one data collection instrument might have affected the trustworthiness and reliability of the findings. Thus, this study used face-to-face semi-structured interviews, non-participant observation, and field notes as techniques for data collection.

Moreover, the national audit on ECD centres found that 'ECD centres' infrastructure has a high proportion of physical defects in the roof and walls and avoidable safety hazards such as sharp, dangerous fixtures [and] obstacles obstructing passages' (RSA 2014:229). Similarly, in the research conducted by Mbarathi et al. (2016), who focused on ECD centres within informal settlements of urban poverty, it was discovered that the infrastructure at registered ECD centres is a matter of concern and suggested that it should be in good condition and functional in such a way as to support disabled people. A study that focuses on other areas of the country might discover something different regarding infrastructure resources at ECD centres. Hence, this study focuses on registered ECD centres situated in both township and suburban areas of Pretoria where contrasting findings may emanate.

Other resources that promote quality early childhood care and education

In as much as this study focuses on infrastructure in ECD centres, it is important to emphasise that infrastructural resources alone cannot enhance the quality of ECCE; other resources, such as teaching and learning materials, play equipment and toys, human and financial resources are vital

elements that could promote quality ECCE. The resources that enhance quality ECCE are generally grouped into structural inputs and process inputs; structural input resources go hand-in-hand with process inputs to provide quality ECCE (Woodhead 1996). Similarly, De Witt (2010) and Excel (2016) stated that the various aspects of the ECCE centre (such as physical facilities, personnel, professional development, management, teaching and learning materials and age-appropriate activities) promote the delivery of quality ECCE. This implies that ECD practitioners' professional development, indoor and outdoor teaching and learning materials, staff managerial and leadership abilities and physical facilities are essential tools in promoting quality ECCE.

Conceptual framework

System framework for understanding social settings

Tseng and Seidman's (2007) study was used as a lens to explore the usage of infrastructural resources in the learning environments of the selected registered ECD centres. The Tseng and Seidman (2007) systems framework was originally used to understand social environments for young people, primarily based on schools and community organisations. Tseng and Seidman (2007) sought to understand how social settings functioned using a systems approach by establishing a framework that defined main settings aspects and how those aspects are interrelated in a system that is applicable in an ECD setting. The authors identified and described elements of settings that can be targets of intervention to optimise quality, which they categorised according to three important aspects of settings:

- Social processes – patterns of transactions between two or more people, or groups of people.
- Resources – human, economic, physical, and temporal.
- Organisation of resources – how resources are allocated and used.

Tseng and Seidman (2007) confirmed that aspects of the setting are actively influenced by each other, resulting in changes to setting outcomes. This implies that certain aspects of the settings (social processes, resources and organisation of resources) should be actively engaged with one another to produce the desired setting outcomes. Relating Tseng and Seidman's (2007) theory to this study means that the available infrastructural resources and their organisation and usage will affect social processes (e.g. the interaction between practitioner and children) and, hence, influence ECCE quality.

The social process: Social processes significantly affect how learners and adults perceive their environment (infrastructural resources) and are, therefore, critical for improving outcomes. Bronfenbrenner (1979), in his ecological systems theory, echoed the environmental effects on children's growth by stating that the environment determines their development. Bronfenbrenner and Morris (1998) also agreed about proximal processes, which signify that the key

factor affecting human development is contact between people and their immediate environments. In addition, Piaget's (1952) cognitive development theory explained how the learning environment interacts with children. The social processes, such as the interaction between learning and the environment, could be related to the process quality indicator in ECCE. This suggests that the interaction between individuals, such as young children, practitioners and their views regarding their infrastructural resources in the ECD centre is vital for improving the quality of ECCE.

Resources: In a systems framework for understanding a social setting, resources are classified as: human, economic, physical or temporal (Tseng & Seidman 2007). Physical resources include space, facilities and buildings. In terms of this study, the description of physical resources is closely related to infrastructural resources.

Organisation of resources: The way in which resources are organised depends on how they are used, which invariably determines the quality of the outcome. Tseng and Seidman (2007) affirmed this by stating that modifying the organisation of resources has the potential to change the outcomes but added that changing resources (or their organisation) is not likely to significantly change setting outcomes, except only if daily social processes are also altered. With regard to early childhood education, the effective usage of resources will improve the interaction between children and practitioners and amongst adults, which will invariably promote the setting's quality of ECCE outcomes.

Setting outcome

The setting outcome is described as whether a setting works or not at a given point in time (Tseng & Seidman 2007). A change in the outcome determination normally indicates an improvement in the functioning of the setting. Hence, in terms of this study, the availability of infrastructural resources and improvement on the use thereof could improve quality ECCE.

Tseng and Seidman's (2007) framework guides this study in identifying infrastructural resources, which are classified as physical resources. It also provides an understanding of how social processes affect how ECD practitioners and children view their environment and how the resources (i.e. infrastructure in this study) are used, which would determine the improvement of the setting outcome (quality ECCE). As a result, the Tseng and Seidman framework was used to support this research.

Methodology

A qualitative research approach was used for this study because it allowed for the collection of data in a natural context where participants could demonstrate their experiences with infrastructural resources in their centers (Creswell & Creswell 2017; Hamilton & Corbett-Whittier 2013). A multiple case

study design was most suitable for this study because it assisted in verifying data and strengthening the validity of the findings (Yin 2017). The data collected were obtained through face-to-face semi-structured interviews, non-participant observation and field notes. A semi-structured face-to-face interview was used to address the research questions, which allowed direct feedback from the participants regarding their experiences of the availability and use of infrastructural resources for quality delivery at ECD centres. Non-participant observation enabled the researchers to see how the infrastructure was used at the ECD centres without involvement in their learning activities. The indoor and the outdoor infrastructure facilities, such as toilets, playrooms and equipment in their playground were observed. Photographs of the resources (without people appearing in them) added to the observation. Field notes were used to capture non-verbal communication and thoughts by the researchers whilst observing and listening during interviews.

The purposive sampling technique was used to identify four registered ECD centres in the township and the suburban community of Pretoria, Gauteng, South Africa. The ECD centres were sampled purposefully as they had to be registered with the DSD to ensure compliance with the National Norms and Standards Policy regarding infrastructure and learning programme resources. Eight participants were chosen for this study: four ECD centre principals and four ECD practitioners who were chosen based on their in-depth knowledge and the information they were privy to, such as the availability and use of resources at the ECD centres (McMillan & Schumacher 2014). The biographical information of the selected centres and participants is provided in Table 1.

The purpose of the study was explained to all the participants and they were given informed consent to sign before the collection of data. To ensure the confidentiality and privacy of personal information related to the participants and to guarantee their anonymity, pseudonyms and codes were used.

Ethical considerations

To observe ethical considerations, the researchers sought and obtained ethical clearance from the Ethics Committee

TABLE 1: Biographic information of centres and participants.

Centre location	Participants (pseudonyms)	Position in centre	Age	Years of experience in ECD centre	Fees per child per month
Centre A township	Red T	Principal	32	4 – In current centre	R450
	Yellow T	Practitioner	42	4 – In current centre	
Centre B township	Blue T	Principal	36	5 – In current centre	R400
	Green T	Practitioner	30	6 – In current centre	
Centre C suburban	Grey S	Principal	61	14 – In other centres; 25 – In current centre	R2300
	Pink S	Practitioner	61	18 – In another centre; 12 – In current centre	
Centre D suburban	Orange S	Principal	46	6 – In another centre; 3 – In current centre	R1350
	Purple S	Practitioner	29	6 – In another centre; 1 – In current centre	

ECD, early childhood development.

of the Faculty of Education at the University of Pretoria and then followed the guidelines prescribed by the committee. Written permission to conduct research was received from the Gauteng Department of Social Development. Participants were asked to sign the given consent form.

Results and discussions

This study espoused the thematic data analysis approach, which was performed manually by systematically coding and categorising the collected data into the themes that materialised (Nieuwenhuis 2016). The results are discussed in terms of the three themes that emerged, namely facilities in the physical structure of the building, spaces in playrooms and playgrounds and use of play equipment.

Facilities in the physical structure of the building

The data revealed that facilities at the participating registered centres included playrooms, playgrounds, kitchens, toilets, washbasins and safety gadgets (e.g. fire extinguisher, first aid box and emergency alert clock). The data showed that ECD centres situated at the township do not have age-appropriate toilets and washbasins for the children; furthermore, the practitioners shared toilets with the children. On the one hand, the township centres have potties, which do not appear to be enough as prescribed by the national norms and standards. On the other, the suburban centres have age-appropriate toilets, washbasins for the children and separate toilets for their practitioners. These were revealed during the non-participants' observation (see the pictures from centres A and C in Figure 2 and 3):

The participants' responses to the interview questions support the field observation note regarding toilets facilities. For example, Ms Blue T and Ms Grey S, respectively, observed:

'We do have two toilets; one for the boys, and one for the girls. We also have potties for the toddlers.'

'The baby-class has its own changeroom, the toddlers have their separate toilets with washbasins and individual towels to wipe their hands. Each of the classes has separate toilets for the children.'

All centres are required to have hygienic, well-maintained and adequate toilet facilities. These include potties, washbasins and toilets for children. For children under the age of three, each child should have his or her own potty, which should be regularly and thoroughly cleaned after each use (RSA 2007). The suburban centres have sufficient and age-appropriate toilets compared with the township centres. Data revealed that the township centres do not have toilet facilities as prescribed in the National Norms and Standards Document (Department of Basic Education [DBE] 2015). This finding aligns with Atmore (2013), who stated that ECD centres situated in rural areas do not have the necessary infrastructure such as toilets, electricity and running water.

Furthermore, data reveal that all the centres have big and hygienic kitchens. For example, Green T and Pink S, respectively, gave the following descriptions of their kitchen:

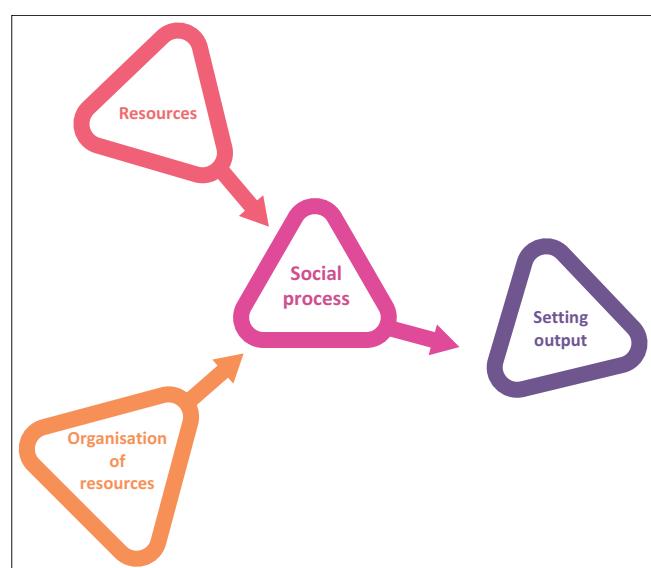
'We have one big kitchen where we prepare the children's meals, and it's always clean.'

'We have a kitchen. We only provide porridge for breakfast. Our lunch is provided by outside service providers. Parents pack snacks for their kids.'

It was evident that participants were aware of the national norms and standards that were required for maintaining nutritional and hygienic kitchens. However, the suburban centres provided better nutritional meals for the children than the township centres. The township centres did not include the menus in their admission policy, neither did they display them in their kitchens; hence, parents are not informed of the kind of meal that will be given to their children on a particular day. In contrast, suburban centres displayed the menus and also allowed parents to pack snacks for their children. This finding in the suburban centres confirmed what Britto, Yoshikawa and Boller (2011) described as the quality dimension to enhance the quality of ECCE and this included nutritious meals or snacks that should be made available to young children, daily.

Spaces and safety measures in playrooms and playgrounds

This theme gave descriptions of the available learning spaces and safety measures put in place in the participating centres. This included spacious learning environments both in playgrounds and in the classrooms. A spacious learning environment is very important for young children. Young children are energetic so they need adequate space to expend their energy, explore, learn and grow. The generated data revealed that participants understand the role of spacious



Source: Tseng, V. & Seidman, E., 2007, 'A systems framework for understanding social settings', *American Journal of Community Psychology* 39(3-4), 217-228. <https://doi.org/10.1007/s10464-007-9101-8>

FIGURE 1: Conceptual framework for understanding social settings.

learning environments in enhancing the quality of ECCE. This was described by participants in the given excerpts:

'There should be clean and safe spaces. The children must be able to move around. We should make them feel free. The little ones can learn from exploring.' (Grey S)

'My classroom has enough space. Also, the playground is big enough for children to play and run around safely.' (Yellow T)

Whilst the participants understand the importance of a spacious learning environment for young children, four out of the eight participants complained about limited space both indoors and outdoors. Green T observed:

'The classrooms are small, not enough space and also our playground is small, the space is a problem for this centre.'

Green T was also aware of the safety implications that small spaces created for young children who need to play freely by saying that:

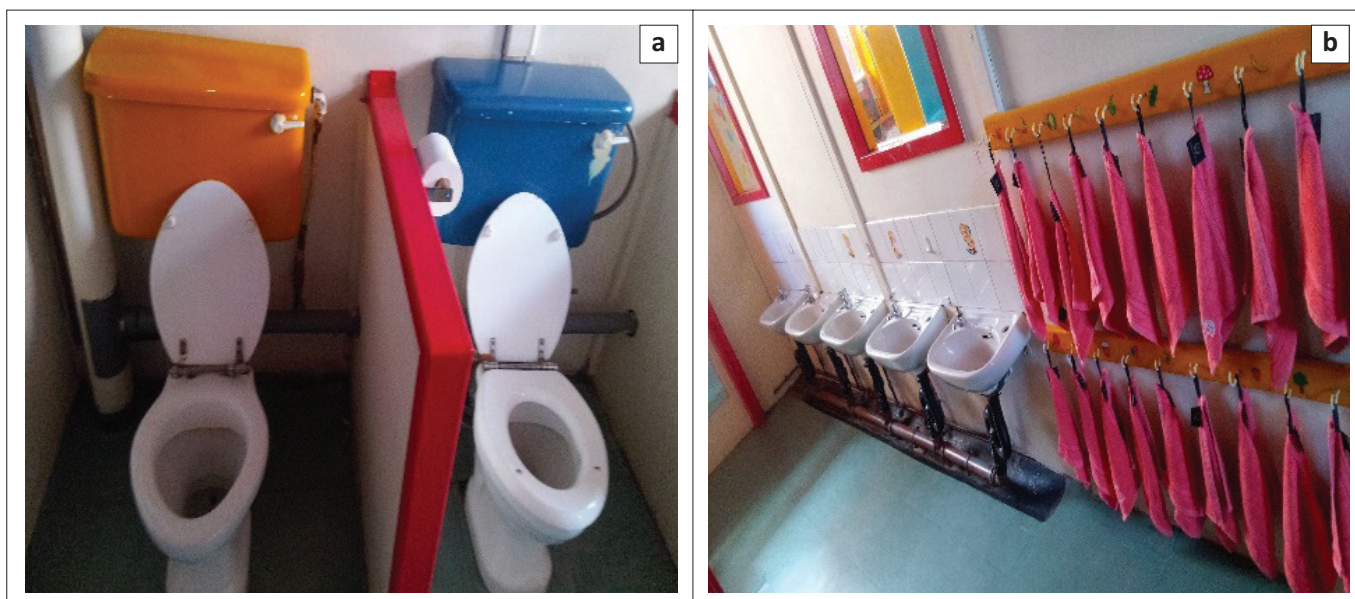
'We don't have too much space where children can freely play around. Limitation of space sometimes causes accidents, the children bump upon themselves.'

Space has been identified as an infrastructure resource and one of the quality dimensions of ECCE (Britto et al. 2011; Woodhead 1996). The data indicated that half of the participants felt that they worked in limited spaces in both indoor and outdoor environments. Limited space in the ECD centres would prevent free and easy movement of teachers and energetic young children. The children will be



Source: Photos taken by authors

FIGURE 2: Photos (a-b) of township centre A's toilet facilities.



Source: Photos taken by authors

FIGURE 3: Photos (a-b) of suburban centre C's toilet facilities.

restricted in exploring their environment because of limited space and there is also the risk of accidents. Half of the participating registered centres do not have sufficient space for children's activities. This contradicts the prescriptions of the government regarding the registration of ECD centres.

The data revealed that the participants are aware of the benefits of safety measures in enhancing quality ECCE. The participants described the safety gadgets they have, such as fire extinguishers, emergency medical first aid boxes and alarms at the gates. The participants also stated what steps they undertake to ensure the safety of learners at their centres. The following responses emerged from this category:

'First, we make sure that the gate is locked; second, we check the classroom to make sure there is nothing that can harm the kids. We have a first-aid kit if a child gets injured so that we can treat them.' (Red T)

'For safety, before we start work every day, the centre must be clean and we have to check all the hazards to ensure children don't get hurt. When children see that there is nothing around that can injure them, they are happy to play and learn. We also make sure the children eat a healthy meal and drink water. And we also check our fire extinguisher to see the expiry date.' (Yellow T)

'I think the most important thing is supervision. We must be vigilant all the time because if you don't look into what the children are doing, you wouldn't know when something negative is going to happen. And of course, your environment must be maintained well so that the children don't get hurt on a piece of wood that is sticking out of the table, for example.' (Grey S)

'We have an alarm, a security gate and panic buttons. If we don't know the people who want to enter at the gate, we don't let them in.' (Pink S)

It was observed that all the centres have first-aid boxes to treat minor injuries. The principals' offices also displayed certificates on training sessions regarding safety measures, which were attended by the participants. The data indicates that the practitioners have knowledge of the benefits of health and safety measures in offering quality learning; specifically, when TP2CA states that 'when children see that there is nothing around that can injure them, they are happy to play and learn'. This finding correlates with Chopra (2016), who stated that protective measures are linked to the indicator of good quality. However, the play equipment at the 'suburban centre C' shown in Figure 5 could cause a safety hazard when climbing the ramp. This indicates that sometimes safety does not lie in the beauty or quality of the resources but in the use thereof.

Use of play equipment

The play equipment and materials of the participating centres are located in the playgrounds and playrooms. These vary from centre to centre as a result of the difference in the fee structure. The participants displayed a sound understanding of the use of play equipment in developing young children physically, socially, emotionally and intellectually. The outdoor play equipment includes swings, jungle gyms, tyres, sandpits and bicycles. These are used during play and learning activities. According to the participants, some are

used to develop the young children's motor skills, hand-eye coordination and physical and social development. The participants described how the outdoor play equipment is used to teach and help the young children grow holistically as evident in the following excerpts:

'We have swings outside; we have tyres too. So they climb on the swings and tyres to develop motor skills. For example, if we are doing sport, we go outside. We use ropes. One learner holds one side and another learner holds the other side, and I ask them to jump over the rope. From these activities, they develop physically and socially.' (Yellow T)

From the use of outdoor resources, a practitioner is also able to identify learners with special needs as seen in Yellow T's response, which showed awareness of the delayed development of children:

'[...] And I can also identify children who are not developed when they cannot perform such activities.' (Yellow T)

Understanding the use of outdoor play equipment in developing young children's growth, in addition to the ability to identify children with learning challenges, is very important and admirable. Outdoor play equipment can be used to engage young children in developmental and learning activities such as balancing, throwing, lifting, climbing, pushing, pulling, crawling, skipping, swinging and riding, hence, improving the quality of ECCE. But the lack of adequate play equipment will hinder children's growth and learning. The data collected reveal that the ECD centres located in the townships do not have sufficient play equipment especially for young children from birth to 3 years of age (indicated in the following responses):

'We do not have enough equipment outside. For example, like the sandpit, we do not have; this also helps the young children to develop motor skills by using a spade to scoop sand into the bucket but this we don't have.' (Yellow T)

'For birth to 3-year-old children, we don't have playing equipment for them on the playground.' (Red T)

In contrast, the data generated showed that the suburban centres have sufficient age-appropriate outdoor play equipment. This was described by the participants in the following excerpts:

'We have quite a lot of big and large play operators. The playing equipment varies for different age groups. The playing equipment for toddlers is different from the young children. We have bicycles, balls and a jungle gym.' (Grey S)

To corroborate participants' responses regarding play equipment, the photographs (Figures 4 and 5) from the field notes present the evidence.

The data revealed that outdoor play equipment was lacking in the township registered centres compared with what was available at the suburban centres. The lack of modern and age-appropriate play equipment at township registered centres indicates that the (township) practitioners are not able to use such equipment although they know their benefits in promoting quality ECCE. The



Source: Photos taken by authors

FIGURE 4: Photos (a-b) of township centre A's outdoor play environments.



Source: Photos taken by authors

FIGURE 5: Photos (a-b) of suburban centre C's outdoor play environments.

findings regarding infrastructure in the participated registered ECD centres located in the township align with the research conducted by Mbarathi et al. (2016), who focused on ECD centres within informal settlements of urban poverty. It was discovered that the infrastructure at registered ECD centres is a matter of concern and suggested that it should be in good condition and functional in such a way as to support disabled people. Similarly, the national audit on ECD centres found that 'ECD centres' infrastructure has a high proportion of physical defects in the roof and walls and avoidable safety hazards such as sharp, dangerous fixtures [and] obstacles obstructing passages' (RSA 2014:229).

Recommendation and conclusion

The infrastructural resources in the participating centres include toilets, kitchens, playrooms and playground spaces. The literature, and this present research's findings, confirm that availability and use of play equipment improve young children's developmental domains such as balancing, coordination, social skills, physical skills and problem-solving skills. The findings revealed that practitioners, both at the suburban and township centres, know how the use of infrastructure, such as space, safety and play equipment, contributes to children's holistic growth and development,

which promotes quality ECCE. However, the township centres have fewer infrastructure resources that promote quality ECCE because of the dire socio-economic conditions of the parents. The township centres charge minimal fees according to the parent's financial capacity and often parents are not in a position to pay the fees. This situation puts the township centres in a state of not being able to obtain the necessary infrastructural resources to promote quality ECCE. The suburban centres charge higher school fees, in some cases almost quadruple of what is charged in the township centres. This gives the affluent suburban centres the advantage to acquire the necessary infrastructural resources. Therefore, young children in the suburban centres enjoy more benefits of infrastructure than the children in the township centres.

In summary, the situation in participating township registered ECD centres contradicts the national norms and standards prescription regarding infrastructural resources that ECD centres should have (RSA 2007). The question arises: How were these centres registered? As sufficient space and safety measures are part of the basic requirements for ECD centres to be registered with the DSD, could it be that no proper supervision by district officials was carried out? Thus, further research should be conducted on the availability of prescribed resources for ECD centre registration.

Infrastructural resources (such as buildings, space, toilets, kitchens and availability of clean water, lighting and ventilation) are identified as structural quality indicators in ECD centres (Bonetti & Brown 2018; Chopra 2016). Most of the time, the infrastructure that accommodates the outdoor and indoor resources are capital-intensive. It is therefore recommended that the provincial government should provide spaces and buildings for ECD centres, in the same way that buildings are provided for public primary and secondary schools. Provision of infrastructure by sponsors or government will reduce the start-up costs of establishing an ECD centre. This will also invariably reduce school fees; thus, parents in the underprivileged areas will be able to send their young children to affordable ECD centres that have the essential resources in both outdoor and indoor environments. Furthermore, it is recommended that policymakers should revisit the stipulated national norms and standards by prescribing the necessary assistance and support regarding the provision of infrastructural resources for ECD centres. This will help ECD centres' owners on how to seek support regarding infrastructure. In addition, space and safety measures should be prioritised when planning for indoor and outdoor learning environments.

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The authors have declared that no competing interest exists.

Authors' contributions

A.Y.A. formulated the study agreed upon by the title and attended to the literature review of the article. K.B. suggested the conceptual framework and developed the protocol. A.Y.A. performed the data collection, data analysis and assisted with the interpretation. Both the authors contributed to the introduction, discussion and concluding sections.

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