



COGNITIVE FLEXIBILITY SKILLS IN EARLY LEARNERS AND THE EFFECTIVENESS OF CHILD-CENTRED PEDAGOGIES IN NURSERY AND PRIMARY EDUCATION IN THE SOUTH WEST REGION OF CAMEROON

Agbor Ekama Prisca Anne (Ph.D)

Senior Lecturer

Department of Educational Psychology,

Faculty of Education,

University of Buea.

Tel: 696915109

Email: priscaagbor@yahoo.com

Abstract

This study examined the relationship between early learners' cognitive flexibility and the effectiveness of child-centred pedagogies in early childhood classrooms. It had three objectives: to explore how cognitive flexibility relates to learner engagement and participation; to examine its relationship with independent learning and autonomy; and to assess its connection with critical thinking and creativity. The study used a descriptive survey design, supported by a correlational approach. Data were collected through teacher questionnaires, classroom observation checklists, and semi-structured interviews. Of the 40 teacher questionnaires distributed, 36 were returned, representing a 90% response rate. Descriptive statistics were used to summarize questionnaire responses, while observations and interviews provided qualitative evidence about classroom behaviours and teachers' perceptions. Correlation coefficients were calculated to examine associations between cognitive flexibility and selected indicators of child-centred learning. The results showed positive relationships between cognitive flexibility and learner engagement ($r = .78$), independent learning ($r = .74$), and critical thinking ($r = .81$). Observations and interviews also indicated that learners who adapted more readily to changing activities tended to participate actively, attempt tasks more independently, and generate alternative ideas during play, inquiry, and problem-solving activities. The findings suggest that cognitive flexibility is an important learner characteristic in child-centred classrooms, and that these environments can offer children opportunities to practise adaptive thinking. The study recommends deliberately incorporating flexible, play-based, inquiry-oriented, collaborative, and problem-solving activities, alongside appropriate scaffolding for learners who have difficulty with transitions. These findings should be interpreted as evidence of association rather than causal effects.

Keywords:

Cognitive flexibility; early learners; child-centred pedagogy; learner engagement; independent learning; autonomy; critical thinking; creativity.

Introduction

Early childhood education provides a foundation for future learning, social participation, and personal development. In these early years, children experience rapid cognitive, social, emotional, and physical growth. Educational experiences during this period are important not only for classroom participation in the moment, but also for building the capacities that support future learning.

Zelazo, Blair, and Willoughby (2016) describe child-centred pedagogy as placing learners at the centre of the educational process by emphasising active participation, exploration, discovery, collaboration, creativity, and autonomy. Teachers facilitate learning by organising meaningful experiences, asking questions, scaffolding understanding, and responding to developmental differences. Play-based learning, inquiry, storytelling, collaborative tasks, projects, and problem-solving are consistent with this approach.

The effectiveness of child-centred pedagogy is shaped by classroom conditions and learner characteristics. Cognitive flexibility is one relevant capacity, encompassing the ability to shift attention, modify strategies, consider alternatives, and adapt behaviour in response to changing demands (Diamond, 2013). In classrooms where activities, expectations, materials, and peer interactions vary, this capacity may support children's effective participation. The present study addresses the need for a closer examination of the relationships between cognitive flexibility and learner engagement, independent learning, and critical thinking in child-centred early childhood classrooms. It retains the manuscript's original focus while interpreting the reported relationships cautiously, as the study design does not establish causation.

Background

Early childhood education is widely recognized as the foundation for lifelong learning and development. In their early years, children undergo rapid cognitive, social, emotional, and physical growth, which strongly influences their future academic achievement and overall development. The educational approaches used at this stage therefore play a critical role in shaping children's learning experiences and developmental outcomes. Among the approaches used in early childhood settings, child-centred pedagogy is considered one of the most developmentally appropriate and effective ways to support holistic learning.

The effectiveness of child-centered pedagogies depends largely on learners' cognitive abilities and developmental characteristics. In early childhood, cognitive flexibility is one of the key abilities that shapes learning. It is the mental capacity to shift attention, adapt to changing situations, consider different perspectives, and adjust responses to environmental demands (Diamond, 2013). As a major component of executive functioning, cognitive flexibility supports problem-solving, creativity, self-regulation, and adaptive learning.

Children with well-developed cognitive flexibility are better equipped to adapt to new classroom situations, transition between tasks, respond to diverse instructional approaches, and engage in creative, independent thinking. These abilities are particularly valuable in child-centred learning environments, where children are expected to explore, make choices, collaborate with peers, and participate actively in the learning process.

In recent years, educational researchers have increasingly recognized the role of executive functioning skills—especially cognitive flexibility—in successful learning. Zelazo, Blair, and

Willoughby (2016) explain that cognitive flexibility helps children shift their thinking strategies, adapt to changing rules, and regulate their behavior in dynamic learning environments. Likewise, Vygotskian perspectives highlight the importance of social interaction and adaptive thinking in children's learning.

Despite the growing emphasis on child-centred approaches in early childhood education, many classrooms still face challenges with learner engagement, independent learning, and critical thinking. Some children find it difficult to adapt to interactive learning environments because they have limited cognitive flexibility. In many education systems, especially in developing contexts, research on how cognitive flexibility affects the effectiveness of child-centred approaches remains limited.

Cognitive Flexibility in Early Childhood

Cognitive flexibility is a component of executive functioning concerned with adapting thinking and behaviour when circumstances change. It includes shifting between tasks, rules, strategies, or perspectives while maintaining attention to a goal (Diamond, 2013). In early childhood classrooms, flexibility may be observed when children change a strategy after an unsuccessful attempt, move from one activity to another, consider a peer's idea, or modify behaviour when classroom rules change.

Executive functions develop progressively during childhood and support school readiness, self-regulation, problem-solving, and learning. Blair and Razza (2007) reported relationships between executive functioning and emerging literacy and numeracy competence. Diamond and Lee (2011) reviewed interventions that can support executive functioning, including activities involving play, physical activity, and structured practice. These findings provide a basis for considering cognitive flexibility within educational rather than purely psychological contexts.

Child-Centred Pedagogy

Child-centred pedagogy rests on the idea that children actively build knowledge through experience and interaction. Dewey (1938) stressed the importance of meaningful experience, while Bruner (1966) highlighted discovery and inquiry. Together, these perspectives inform classroom practices that encourage children to explore, make choices, collaborate, solve problems, and connect learning to their experiences.

Child-centred practice still requires structure. Young learners may need predictable routines, clear expectations, modelling, and scaffolding. The pedagogical challenge is to provide this structure while making room for autonomy, exploration, and adaptive responses.

Cognitive Flexibility and Engagement

Learner engagement involves attention, interest, participation, and involvement. In child-centred classrooms, children often move between discussions, play, group work, exploration, and individual activities. Cognitive flexibility may help them navigate these transitions by redirecting their attention and adapting to changing task demands.

Cognitive Flexibility, Independence and Autonomy

Independent learning in early childhood involves children becoming more able to initiate activities, make choices, try tasks, monitor their progress, and seek help appropriately. Executive functioning supports goal-directed behaviour and self-regulation (Miyake et al.,

2000). Flexible learners may be better equipped to adjust their strategies when a task becomes difficult instead of giving up or immediately waiting for teacher assistance.

Cognitive Flexibility, Critical Thinking and Creativity

Critical thinking means examining information, weighing alternatives, solving problems, and responding with reason. Creativity means generating original or suitable ideas. Flexibility supports both, helping learners move beyond an initial response to consider other possibilities. Deák (2003) connects flexible cognition with the ability to consider alternatives, while Bruner (1966) highlights discovery and problem-solving as part of active learning.

Theoretical Framework

Piaget's Cognitive Development Theory

Piaget (1952) sees children as active builders of knowledge, adapting their cognitive structures through experience. Assimilation and accommodation help explain how learners respond when their existing ways of thinking cannot adequately account for a new experience. Child-centred activities that let children explore, manipulate, compare, and revise ideas reflect this emphasis on active construction.

Vygotsky's Sociocultural Theory

Vygotsky (1978) highlights the social and cultural foundations of cognitive development. Learning is supported by interaction, language, and guidance within the Zone of Proximal Development. Collaborative activities, dialogue, peer interaction, and teacher scaffolding can therefore give children opportunities to practise alternative ways of responding to problems and adapting to changing classroom demands.

Bruner's Constructivist Theory

Bruner (1966) emphasizes discovery, inquiry, and active participation. Learners build understanding by engaging with problems and concepts, rather than simply receiving information. This theory supports the study's focus on independent learning, problem-solving, and creativity.

Dewey's Experiential Learning Theory

Dewey (1938) highlights learning through experience and meaningful activity, underscoring how play, inquiry, collaboration, and reflection provide contexts for children to develop and practice adaptive thinking.

Problem Statement

The growing use of child-centred pedagogies in early childhood education reflects increased recognition of the value of active learning, learner participation, creativity, and independent thinking. These classrooms are designed to promote exploration, collaboration, problem-solving, and learner autonomy. However, the effectiveness of these approaches varies considerably from one learner to another.

A major challenge for early childhood educators is that children vary in their ability to adapt to dynamic, interactive learning environments. Some have difficulty shifting attention between tasks, adjusting to new classroom situations, responding to multiple instructional demands, and

thinking flexibly. These challenges can limit active participation and reduce the effectiveness of child-centred pedagogical practices.

Cognitive flexibility is increasingly viewed as essential for successful learning in child-centred classrooms, as it helps children adapt, think creatively, and solve problems. However, despite its recognized importance, few empirical studies have examined how cognitive flexibility specifically affects the effectiveness of child-centred pedagogies in early childhood classrooms, particularly in developing educational contexts.

Furthermore, many early childhood teachers may not fully understand how cognitive flexibility influences learner engagement, independent learning, and critical thinking. This gap in understanding may lead to ineffective instructional strategies and insufficient support for learners with low cognitive flexibility.

Consequently, research is needed to examine the relationship between cognitive flexibility skills and the effectiveness of child-centred pedagogies in early childhood classrooms. This study addresses this gap by investigating how cognitive flexibility skills influence learner engagement, independent learning, and critical thinking among young learners.

Objectives and Research Questions

To explore how early learners' cognitive flexibility skills affect the effectiveness of child-centred pedagogies in early childhood classrooms.

Objectives

1. To explore how cognitive flexibility skills influence learner engagement and participation in early childhood classrooms.
2. To examine the relationship between cognitive flexibility and independent learning and autonomy in early learners.
3. To assess the relationship between cognitive flexibility skills and critical thinking and creativity in child-centred classrooms.

Research Questions

1. How do cognitive flexibility skills relate to learner engagement and participation in early childhood classrooms?
2. What relationship exists between cognitive flexibility skills and independent learning and autonomy among early learners?
3. To what extent are cognitive flexibility skills associated with critical thinking and creativity in child-centred classrooms?

Methodology

Research Design

The study used a descriptive survey design alongside a correlational approach. The descriptive component documented teachers' perceptions and classroom patterns, while the correlational component examined associations between cognitive flexibility and selected indicators of child-centred learning. Because no variables were experimentally manipulated, the design does not support causal conclusions.

Population and Sample

The study population included early childhood learners aged approximately 3–8 years and teachers at selected early childhood education centres. The target sample consisted of 10 schools, 40 teachers, and 120 learners. The teacher questionnaire analysis was based on 40 questionnaires distributed; 36 were returned and completed, yielding a 90% response rate.

Schools and teachers were selected purposively, ensuring representation of public and private settings, while learners were randomly selected from the identified classrooms.

Instruments and Procedures

Instrument	Purpose
Teacher questionnaire	Document teacher perceptions of cognitive flexibility, engagement, independence, critical thinking and creativity.
Observation checklist	Record learner adaptability, transitions, participation, attention, problem-solving and interaction.
Semi-structured interview	Explore teachers' experiences and perceptions of learner behaviour in child-centred activities.

Teachers completed questionnaires, classroom activities were observed, and selected teachers took part in semi-structured interviews. Experts reviewed the content validity, while reliability was assessed using Cronbach's alpha, with .70 set as the acceptable threshold. Ethical procedures included informed consent, confidentiality, voluntary participation, and safeguards for children's well-being.

Findings

Table 3: Response Rate

Response	Frequency	Percentage
Returned	36	90.0%
Not returned	4	10.0%
Total	40	100.0%

Source: The Researcher, 2026

Table 4: Respondent Characteristics

Gender	Frequency	Percentage
Female	28	77.8%
Mal	8	22.2%
Total	36	100.0%

Source: The researcher, 2026

Table 5

Teaching experience	Frequency	Percentage
1–3 years	8	22.2%
4–6 years	12	33.3%
7–10 years	10	27.8%
Above 10 years	6	16.7%
Total	36	100.0%

Source: The researcher, 2026

Table 6

Qualification	Frequency	Percentage
Certificate	6	16.7%
Diploma	14	38.9%
Bachelor's degree	12	33.3%
Postgraduate	4	11.1%
Total	36	100.0%

Source: The researcher, 2026

Table 7: Cognitive Flexibility and Engagement

Statement	SA	A	N	D	SD
Flexibility supports active participation	20 (55.6%)	12 (33.3%)	2 (5.6%)	2 (5.6%)	0
Flexible learners adapt to changing tasks	18 (50.0%)	14 (38.9%)	2 (5.6%)	2 (5.6%)	0
Flexibility improves attention	17 (47.2%)	15 (41.7%)	2 (5.6%)	2 (5.6%)	0
Low flexibility affects group engagement	16 (44.4%)	14 (38.9%)	4 (11.1%)	2 (5.6%)	0

Source: Researcher 2026

The findings indicate that most teachers strongly agreed that cognitive flexibility positively influences learner engagement and participation. During interviews, teachers explained that flexible learners were more curious and enthusiastic, and more willing to join classroom discussions and exploratory learning activities. Classroom observations also showed that cognitively flexible learners moved more smoothly between tasks and stayed attentive during play-based learning. These findings suggest that cognitive flexibility enhances learner engagement by helping children adapt to interactive, dynamic classroom environments.

Table 8: Cognitive Flexibility and Independent Learning

Statement	SA	A	N	D	SD
Flexible learners complete tasks independently	19 (52.8%)	13 (36.1%)	2 (5.6%)	2 (5.6%)	0
Flexibility encourages independent exploration	18 (50.0%)	14 (38.9%)	2 (5.6%)	2 (5.6%)	0
High flexibility is associated with confidence	20 (55.6%)	12 (33.3%)	2 (5.6%)	2 (5.6%)	0
Flexible learners adapt strategies when challenged	21 (58.3%)	11 (30.6%)	2 (5.6%)	2 (5.6%)	0

Source: The researcher, 2026

The responses show strong agreement that flexibility supports independent exploration, confidence, task completion, and strategy adaptation. Interview evidence likewise suggests that flexible learners are more likely to attempt tasks and try alternative strategies.

Table 9: Cognitive Flexibility, Critical Thinking and Creativity

Statement	SA	A	N	D	SD
Flexible learners generate multiple ideas	22 (61.1%)	10 (27.8%)	2 (5.6%)	2 (5.6%)	0
Flexibility enhances problem-solving	21 (58.3%)	11 (30.6%)	2 (5.6%)	2 (5.6%)	0
Flexible learners show creativity in play	19 (52.8%)	13 (36.1%)	2 (5.6%)	2 (5.6%)	0
Flexible learners ask thoughtful questions	18 (50.0%)	14 (38.9%)	2 (5.6%)	2 (5.6%)	0

Source: The researcher, 2026

Teachers strongly endorsed all four indicators. The findings show that observation evidence captured flexible learners actively engaging in inquiry and exploration, generating alternative responses, and adapting their problem-solving strategies.

Observation and Interview Findings

Observation findings indicated that learners who demonstrated greater flexibility adapted more readily to transitions, actively participated in group activities, showed curiosity and creativity during play, solved problems with less immediate assistance, interacted positively with peers, and sustained attention during inquiry-based activities. Learners perceived as less flexible had greater difficulty with changing routines and transitions.

Three themes emerged from the interviews. First, teachers associated flexibility with greater classroom participation. Second, they described flexible learners as more confident and proactive when attempting tasks independently. Third, they linked flexible thinking to imaginative responses in storytelling, play, and inquiry activities.

Table 10: Correlation Analysis

Variables	r	Description
Cognitive flexibility – learner engagement	.78	Strong positive association
Cognitive flexibility – independent learning	.74	Strong positive association
Cognitive flexibility – critical thinking	.81	Very strong positive association

Source: The Researcher, 2026

The reported coefficients indicate positive associations between cognitive flexibility and all three outcome domains.

Discussion

Engagement and Participation

The reported link between cognitive flexibility and engagement aligns with the role of executive functioning in helping learners manage changing classroom demands. Learners who can shift their attention and adapt their strategies may find it easier to move among play, discussion, group work, and individual tasks. This finding is broadly consistent with research connecting executive functioning to school readiness and classroom functioning (Blair & Razza, 2007).

Independent Learning and Autonomy

The positive association with independent learning suggests that flexible thinking may encourage children to try tasks, make choices, and adjust their strategies when they encounter difficulties. This interpretation aligns with the broader executive-function literature (Miyake et al., 2000). Importantly, early childhood independence develops with appropriate adult guidance, so child-centred practice should balance autonomy with scaffolding.

Critical Thinking and Creativity

The strongest reported association was between cognitive flexibility and critical thinking ($r = .81$). Teachers described flexible learners as more likely to generate multiple ideas, ask questions, and adapt their responses. This pattern is consistent with Deák's (2003) account of flexible cognition and with constructivist approaches emphasizing inquiry and discovery. However, the result should be interpreted cautiously, as the study does not establish temporal or causal direction.

Implications for Practice

The findings suggest that teachers can use child-centred activities not only to deliver content but also to give children repeated opportunities to think adaptively. Effective practice may include open-ended questions, imaginative play, inquiry tasks, collaborative problem-solving, storytelling with alternative endings, and activities where children test and revise their strategies.

- Keep routines predictable, while adding manageable variations to practise transitions..
- Ask open-ended questions that can have more than one reasonable answer.
- Encourage children to explain choices and consider alternative strategies.
- Use visual cues, warnings, modelling, and peer support to help learners who struggle with transitions.
- Use play and inquiry to create opportunities for children to experiment, revise, and solve problems.
- Support teacher professional development on executive functioning and child-centred pedagogy.

Limitations

The study has several limitations. The teacher questionnaire analysis included 36 respondents, which limits statistical generalization. Teacher perceptions and classroom observations may also be affected by respondents' or observers' interpretations. As reported in the manuscript, the correlation analysis does not include significance tests or confidence intervals. In addition, the non-experimental design cannot establish causal effects. Finally, the selected study setting limits how broadly the findings can be generalized to other educational contexts.

Conclusion

The study explored the relationship between cognitive flexibility and the effectiveness of child-centred pedagogies in early childhood classrooms. Questionnaire responses, observations, interviews, and the reported correlation analysis showed a positive association between cognitive flexibility and learner engagement, independent learning, critical thinking, and creativity. These findings suggest that flexible thinking supports children's participation in active, exploratory learning environments.

The findings also highlight the importance of classroom conditions. Child-centred pedagogy can give children opportunities to practise shifting their attention, considering alternatives, adapting strategies, and collaborating with peers. However, the evidence is correlational, and cognitive flexibility is just one of several factors that may shape learning and participation.

Recommendations

4. Early childhood teachers should intentionally blend play, inquiry, problem-solving, storytelling, and collaboration to encourage flexible thinking.
5. Teachers should pair predictable classroom routines with manageable variations, giving children opportunities to practise transitions and adapt to change.
6. Schools should offer professional development in cognitive flexibility, executive functioning, child-centred pedagogy, and developmentally appropriate scaffolding.
7. Future research should draw on larger, more diverse samples and pair teacher reports with direct, age-appropriate assessments of executive functioning and creativity.
8. Longitudinal or experimental studies should investigate whether specific child-centred interventions lead to measurable improvements in cognitive flexibility and related learning outcomes.

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