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REPORT

RATIONALE AND PROPOSED ITEMS FOR THE ESWATINI EARLY LEARNING DEVELOPMENT ASSESSMENT

DEVELOPED BY JET EDUCATION SERVICES AND DATADRIVE2030 FOR THE MINISTRY OF EDUCATION AND TRAINING

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RESEARCH • IMPLEMENTATION • MONITORING & EVALUATION

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Acronyms and abbreviations

ASQ	Ages and Stages Questionnaire
BEQI	Brief Early Childhood Quality Inventory
EAPCDS	East Asia Pacific Child Development Scales
ECD	Early Childhood Development
ECCDE	Early Childhood Care, Development, and Education
ECERS (E)	Early Childhood Environmental Rating Scale (Extended)
EF	executive functioning
ESSP	Education Sector Strategic Plan
ELOM	Early Learning Outcomes Measure
IDELA	International Development and Early Learning Assessment
JET	JET Education Services
GPE	Global Partnership for Education
LPQA	Learning Programme Quality Assessment
MELE	Measure of Early Learning Environment
MODEL	Measure of Development and Early Learning
MoET	Ministry of Education and Training
PQA	Programme Quality Assessment
QASS	Quality Assurance and Support System
UNESCO	United Nations Educational, Scientific and Cultural Organisation.
UNICEF	United Nations Children's Fund
ZAMCAT	Zambian Child Achievement Test

1 Introduction and context

The objective of this desktop review is to provide a comprehensive rationale for the selection of Early Childhood Care, Development, and Education (ECCDE) assessment tools being adapted for the Eswatini Ministry of Education**.**

ECCDE covers a broad range of support services for young children and their families, including health care, early childhood care and education, home visiting programmes, social protection, and child welfare (Britto et al., 2011). Evidence from longitudinal studies shows that the benefits of healthy childhood development extend to older ages: birth weight, infant growth, and physical and cognitive capacities in childhood are associated with or predictive of physical and cognitive capacities in adulthood, hearing capacity, and life expectancy, with leading economists saying that investing in ECCDE/ECD will not only improve child development, but help to reduce poverty and inequality, ensure healthy lives, achieve gender equality, and promote peaceful societies (Nores et al., 2024).

Even though the early years constitute a critical stage of human development, ECCDE faces many challenges, including inadequate policy support, financing, and governance, especially in low- and lower-middle-income countries (The World Bank, 2022). The coverage of ECD services in these countries is generally uneven, and services are less likely to reach the most vulnerable children, especially in rural areas and those with high rates of unemployment and poverty. When poor children have access to ECD services, these services are generally of an inferior quality to those available to children from more affluent backgrounds (Biersteker et al. 2016, Giese et al., 2022). Many ECD centres in marginalised areas tend to have limited equipment for play, inadequate educational resources, and a lack of quality structured learning programmes (Aina & Bipath, 2022). Consequently, children in these areas are vulnerable to factors that continue to disadvantage them throughout their lives. The costs of inaction are substantial (see Black et al., 2017; Hoddinott et al., 2013; Richter et al., 2017)

In Eswatini, most children between 3-5 years old who access ECCDE services do so through private providers and communities, including individuals, churches, and non-governmental organisations. In 2020, only 20% of children between 3-5 years who were enrolled in ECCDE centres were publicly supported, mainly through the pilot programme for Grade 0 in 80 public primary schools (Eswatini Economic Policy Analysis and Research Centre (ESEPARC), 2022). Enrolment in ECCDE centres for children between 0-5 years is very low, estimated at 22% (UNICEF, 2023). However, participation in Grade 0 (for 5-6-year-olds) is slightly higher, at 40% (UNICEF, 2023).

According to UNICEF (2023, p. 5), the proportion of children aged 3 to 5 who demonstrate age-appropriate development in numeracy and literacy is the lowest in Lubombo at 12.8**%**, while Hhohho has the highest percentage, estimated at 23.9%**.** Most of the children who are not enrolled in ECCDE centres are from poor families. While an estimated 48% of children from the wealthiest quintile are enrolled for ECCDE, only 28% come from the poorest quintile. This is largely because of cost barriers exacerbated by poverty (The World Bank, 2022). Recognising the importance of ECCDE, the Government of Eswatini has made it a priority in its new Education Sector Strategic Plan (ESSP) for 2023-2027, setting ambitious goals to increase enrolment and improve early learning opportunities.

However, challenges such as the COVID-19 pandemic, weak multi-sectoral coordination, and inconsistent data collection have slowed progress in achieving these goals (UNICEF, 2023). The government's efforts, supported by international partners such as the World Bank and the Global Partnership for Education (GPE), aim to transform the ECCDE and basic education systems to strengthen human capital development in the

country. This introduction underscores the urgent need for comprehensive investment and policy reforms to ensure equitable access to quality ECCDE services for all children in Eswatini.

Section 1 provides an overview of Early Childhood Care, Development, and Education (ECCDE) services in Eswatini, while Section 2 outlines the foundational approach taken during the design phase of the assessment tools. Section 3 examines the key predictors of achievement and performance in ECCDE settings.

Additionally, the annexures include the proposed assessment items along with their sources. These items may be further refined during the item review and training phases of the project.

2 Background: Approach to the Design of the Measures

1. **Alignment with Curriculum for Grade 0 and ECCE and Eswatini Language of Instruction Policy**

Countries vary in their expectations for child learning, and any national assessment needs to align with local curriculum goals. The development domains and subdomains for child outcomes and classroom quality were mapped against the Grade 0 Syllabus and the language policy noted. While the Eswatini Early Learning Development Standards are validated, the age range for these standards is from birth to 60 months, and we needed to allow for the 60-74-month age range.

2. **The design is informed by research on predictors of school achievement in the early years and classroom variables associated with good child learning outcomes**

Measures need to be practical and not too lengthy to administer, so the focus should be on domains and subdomains that the Ministry of Education and Training (MoET) considers to be essential. There are two criteria for determining this: firstly, the extent to which the items are associated with child outcomes (See Section 3) or with classroom set-up and practices which are associated with child outcomes (3.3)(Secondly, there are additional domains which are of broader importance in the Eswatini context (e.g. cultural knowledge, health knowledge). This type of item is represented in some early childhood batteries and is easy to measure as part of classroom inputs(e.g. thematic content and materials).

3. **The design is informed through consultation with MoET stakeholders and experts**

- Initial online item review workshops were held with the MoET to select priority child outcome and classroom quality domains from the policy documents.
- A two-day workshop was held on 11 and 12 December 2024 with Eswatini experts to check for alignment of the criteria selected for both the child outcome assessment and the classroom quality tool and approve items for piloting. This workshop was attended by the MoET pilot lead, ECCDE lead, and the Primary School Lead, eight ECCDE inspectors/ECCDE officers from the different regions, two Grade 0 teachers from private Grade 0 classes, an ECCDE College lecturer, the University of Eswatini (UNESWA) Director, and four World Bank officials linked to the project as well as the JET/DataDrive2030 team.
- Once the tools have been piloted, a report will be presented to the MoET to engage with experts on the findings and recommendations. A second review session with other stakeholders in the MoET who would like to participate (such as teachers and occupational therapists) is encouraged.

4. **The measures will draw as far as possible on existing measures used in similar contexts**

Item identification has been informed by measures used in regional and/or low- and middle-income countries (LMIC) contexts. Measures include: the Early Learning Outcomes Measure (ELOM); Zambian Child Achievement Test (Zamcat); Measuring Early Learning Quality and Outcomes (MELQO); International Development and Early Learning Assessment (IDELA); East Asia Pacific Child Development Scales (EAPCDS), mainly for child outcomes; Measure of Early Learning Environment (MELE); Brief Early Childhood Quality Inventory (BEQI); Teach ECE; LEGO ENGAGE tool, as adapted for LMIC settings including South Africa; Learning Programme Quality Assessment (LPQA); the South African Department of Basic Education's Quality Assurance and Support System (QASS); the HighScope Programme Quality Assessment (PQA); and Early Childhood Environmental Rating Scale (Extended) (ECERS), which has been widely used in adapted forms across the world. The items will be thoroughly piloted prior to the final selection of items to ensure that they are fair and appropriate for the different Eswatini contexts.

5. **The design is informed by issues of practicality for systemwide administration.**

Considerations, with due weight given to the need for rigour in delivering a reliable assessment, include training time and requirements, qualifications of assessors, cost of assessment kit and the need for measures which require user licence fees. In addition, administration should not be difficult, nor excessively long per child or classroom, without sacrificing the depth of information gathered. Similarly, the duration of classroom observations should be sufficient to observe all the competencies and programme elements covered in the measure. The classroom observation measures should be suitable for both paper and digital administration. The child assessment measures will need to be administered digitally given the importance of embedded stop rules, skip logic and timing features which contribute to data accuracy and reduce administration time. Data quality is enhanced through digitisation, built-in skip logic, parameter constraints and quality checks, which ultimately save time and money. In addition, real-time fieldwork monitoring and data cleaning is facilitated by having daily data checks. Note that these digital data collection tools operate offline on the Survey CTO platform and only require an internet connection once data has been collected. As well as data being available at national and regional level, some systems provide for disaggregation to district level and identify particular schools for urgent intervention; for example, a system developed for the South African Department of Basic Education classifies sites according to their implementation status and then determines the support required at each site, from those requiring extensive assistance to those that could be used as exemplar or mentoring sites.

3 Predictors of school achievement in the early grades

Feeding into the selection of domains and sub-domains for each assessment is the body of research that exists concerning which areas of teaching and learning are most important to consider when measuring children's development and the quality of learning environments. Although teaching should not be limited to what is covered in the assessment tools, it is never possible to have an assessment that can cover all areas of teaching and learning while still meeting the practical requirements of an assessment noted above. For that reason, it is important that we identify which items will best measure the domains that are known to be essential for measuring quality teaching and learning as well as school readiness outcomes. The section below provides a summary of some of the research and rationale for the inclusion of each domain in the learner assessment tool.

3.1 The role of socio-economic status in early school performance

A child's socio-economic status and home learning environment has a significant impact on the child's early academic performance. Both in South Africa and internationally, children from less deprived households, who come from homes with higher levels of education and are likely to have attended better preschools and schools, outperform their more deprived counterparts (Akram et al., 2024; Duncan, et. al., 2010; Tredoux & Dawes, 2018).

Akram et al. (2024) conducted a study on the role of socio-economic status (SES) on ECD in Pakistan. The sample consisted of children under the age of 5 years in four provinces of Pakistan from 2017 to 2020. The study identified socio-economic variables such as parental education, child nutrition, household economic status and household environment as predictors of low academic achievement in ECD.

Nutrition plays a foundational role in early development. Akram et al. (2024) emphasise that malnutrition, particularly stunting, is negatively correlated with developmental outcomes, with similar findings from Shrestha et al. (2022) revealing how poor nutrition affects the cognitive, physical and emotional development of children in Nepal. Interventions focusing on maternal and child nutrition have been shown to yield significant improvements in developmental indices, underscoring the need for comprehensive nutritional programmes around the world. In Eswatini, approximately 23% of children under 5 years are stunted (UNICEF, 2022). It is estimated that only 38% of children aged 6–23 months receive the minimum acceptable diet, and 11% of children under 5 years are overweight (UNICEF, 2022).

In addition, research from the ELOM standardisation in South Africa indicates that at the commencement of Grade R, children's performance is correlated with their socio-economic background (Van den Berg, 2013). A small percentage (about 11.5%) of children from the poorest quintile schools (quintile 1)[1] commence Grade R at the expected standard, while far more children (about 48%) from areas feeding into quintile 4 and 5 schools meet the expected standard on entering Grade R (at age 5) (Van den Berg, 2013). Although there is clear evidence in low-income countries that participation in quality preschool programmes makes a significant difference to poor children's academic outcomes, it is not common for poor children to have access to high-quality programmes (e.g. Barnett, 2011; Engle, 2011; Singh & Mukherjee, 2017).

3.2 Key competencies that predict early school performance

The following competencies are highly associated with school readiness. Sensory-perceptual skills and visual-motor coordination underpin many of them (Excell & Linington, 2011; Joubert, 2015).

3.2.1 Executive functioning skills

Executive functioning (EF) refers to a set of cognitive processes that include **planning**, **working memory**, **inhibitory control**, **cognitive flexibility**, and **self-regulation** (Diamond, 2013; Diamond & Ling, 2020; Segers et al., 2016). These skills develop rapidly between the ages of 3 and 5 and play a pivotal role in helping children navigate social interactions and overcome academic challenges in early childhood settings.

Play is particularly important for EF development as it provides children with opportunities to practice self-regulation, problem-solving and adaptive thinking in engaging and enjoyable ways. According to Blair and Ursache (2013,p.2), the core components of executive functioning include:

[1] The quintile system used by South Africa's Department of Basic Education categorizes public schools into five quintiles (Quintile 1–5) based on socioeconomic factors, with Quintile 1 representing the poorest schools that receive the highest government funding and Quintile 5 representing the least disadvantaged schools that receive the least funding.

- **Working Memory:** The ability to hold and manipulate information over short periods, such as remembering a series of digits in reverse order or solving mental arithmetic problems.
- **Inhibitory Control:** The ability to suppress automatic or dominant reactions in favour of more appropriate behaviour. It involves controlling emotional responses and avoiding premature conclusions when solving problems (behavioural and cognitive aspects).
- **Cognitive Flexibility:** The ability to switch between different problem-solving strategies or rules. It involves adjusting to new rules or changing tasks, such as in tasks like the Dimensional Change Card Sort (Frye et al., 1995; Zelatzo, 2006).

Research has shown strong links between executive functions, particularly **working memory** and **inhibitory control,** and early numeracy skills. Significant correlations have been observed between EF and mathematical tasks such as counting, addition and subtraction (LeFevre et al., 2010). These executive functioning skills are often assessed through activities like **Pencil Tapping**, **Puzzle Completion** and the **Dimensional Change Card Sort (DCCS)** task, which evaluate attention, working memory and problem-solving abilities.

In summary, proficiency in both cognitive skills and foundational mathematical concepts is essential for children's long-term academic success.

3.2.2 Emergent Numeracy and Mathematics

Early mathematics skills such as counting, number knowledge, estimation and measurement are among the strongest predictors of overall academic achievement later in life (Jordan et al., 2009; Manfra, 2012; Watts et al., 2014). Numeracy skills developed in early childhood, including counting fluency and number identification, play a pivotal role in future mathematics success. Often referred to as 'gateway skills', these foundational abilities serve as early indicators of later mathematical proficiency, much like sound -naming fluency is predictive of reading ability (Jordan et al., 2009; Manfra, 2012).

In addition to numeracy, the use of measurement-related vocabulary, particularly words describing size, has been shown to predict success in spatial problem-solving tasks (Pruden et al., 2011). Similarly, early understanding of symbolic mapping, calculation and patterning is a significant predictor of mathematical performance as children enter first grade (LeFevre et al., 2010).

Foundational mathematical concepts such as numeral identification, recognising number patterns, and basic operations like addition and subtraction provide the building blocks for later mathematical development. These skills, often assessed through word problems, are critical for applying mathematical reasoning to real-world scenarios (Geary, 2011).

Beyond specific math-related abilities, cognitive skills, including visual-spatial abilities, working memory, short-term memory, inhibitory control and planning, have also been highlighted as important contributors to early mathematical development (Bull et al., 2008; LeFevre et al., 2010).

3.2.3 Language and Literacy

Emerging early literacy skills that have been identified as strong indicators of future literacy success include vocabulary, the ability to engage in letter recognition (before age 5), comprehension of stories, writing, familiarity with nursery rhymes, and phonological awareness (O'Carroll & Hickman, 2012; Strickland & Riley-Ayers, 2006).

Research has consistently shown that early exposure to activities that help children recognise and manipulate sounds supports the development of their reading and writing skills (National Early Literacy Panel, 2008,p.56). Between the ages of 3 to 5 years, children typically begin to play with sounds, sing songs and engage in activities like rhyming games or clapping syllables (O'Carroll & Hickman, 2012). These activities help build the necessary skills to decode words as they learn to read.

Dubeck and Gove (2015) provide a comprehensive overview of the key domains of early literacy that can be measured and are critical for later reading success:

- **Phonological Awareness:** This refers to the ability to recognise individual sounds (phonemes) in words, which is crucial for literacy development. It is one of the most researched early literacy skills and predicts future word-reading success.
- **Print Knowledge:** This involves understanding how written language works, including concepts like book orientation, reading direction (left to right, top to bottom) and the purpose of reading. It includes letter recognition and knowledge of letter names and their sounds. Letter knowledge is a strong predictor of early reading skills such as decoding and reading comprehension. Letter recognition is particularly important before age 5 as it is one of the strongest predictors of later reading achievement (Burgess & Lonigan, 1998).
- **Orthographic Knowledge:** This is the understanding of written words and how letter sequences represent spoken sounds. In early stages, children learn that letters stand for speech sounds, memorise text, associate meaning with images and identify words by their unique shapes. This foundational knowledge helps in understanding the connection between speech and print.

Additionally, **oral language experiences,** including conversations with adults, storytelling and exposure to rich vocabulary, are foundational for later reading success. National Early Literacy Panel (2008) highlights that children with strong oral language skills are better equipped to handle reading tasks as they are more likely to listen attentively, understand spoken language and follow instructions. These abilities contribute to their overall performance in reading, writing and classroom activities such as problem-solving and group participation.

Finally, **language and literacy development** are strongly supported by **perceptual-motor skills** such as spatial awareness, orientation and sensory processing (auditory, visual and temporal). These skills are critical for ensuring that children can engage effectively with both spoken and written language (Excell & Linington, 2011; Joubert, 2015).

As illustrated in Figure 1, language and literacy skill acquisition is strongly underpinned by perceptual-motor skills including spatial awareness and orientation and auditory, visual and temporal sensory awareness (Excell and Linington, 2011, Joubert, 2015).

Figure 1: Perceptual-motor development and behaviours supporting links to literacy
Source: Excell and Linington, 2011

Develops through

SPATIAL AWARENESS AND ORIENTATION

Gross motor movements: balance, posture, correct sitting position
Fine motor movements: correct pencil grip, turning pages of a book
Position in space: correct positioning of letters, e.g., above and below the line
Crossing midline: being able to write/read across a page
Directionality: knowing where to start reading/writing – from top to bottom

SENSORY AWARENESS

Visual and Auditory

Memory: being able to remember letters, words and sentences seen or heard
Matching/discrimination: being able to recognise, through sight or hearing, similarities or differences in letters/words
Closure: being able to close a letter or complete a word, e.g., an initial 'but' could depending on context, lead to butterfly/butternut/butter
Constancy: knowing that a letter always represents a specific sound, e.g., an a is still an 'A'
Figure ground: being able to pick out a particular letter/word/symbol from a background

TEMPORAL AWARENESS BEHAVIOURS

Rhythm: fluidity in speaking, reading and writing
Coordination: eye-hand coordination etc.
Inner and outer sense of time, e.g., timing of utterances, use of pause etc.

Promotes Literacy

3.2.4 Fine Motor and Gross Motor Development

Fine motor skills are critical for tasks that require hand-eye coordination and dexterity, which are essential for activities such as writing, drawing and even manipulating classroom tools (Cheng & Liao, 2023; Hughes et al., 2022; Morrison & Brown, 2021). As children develop these skills, they not only gain greater independence in performing daily tasks but also enhance their ability to engage with academic content.

Recent research has demonstrated that fine motor skills are directly linked to early literacy and numeracy outcomes. For instance, a study by Pangelinan et al. (2021) highlighted that early fine motor skills such as the ability to hold and control a pencil are strong predictors of reading and writing abilities later on. Moreover, fine motor skills are often linked to attention and self-regulation. The ability to focus on a task such as a puzzle or building with blocks requires coordination and concentration, both of which are critical for learning in a classroom setting (Hughes et al., 2022).

Gross motor skills, which involve the use of larger muscle groups, are essential for coordination, balance and physical control. Sember et al. (2020) found that children who engage in regular physical activity and develop strong gross motor skills tend to score higher on tests of EF such as working memory, attention and problem-solving. Studies by Singh et al. (2022) highlight that children who engage in activities that promote physical coordination such as running or playing team sports tend to have better cognitive flexibility, working memory and attention control, all of which are crucial for academic achievement.

While fine motor and gross motor skills are often studied separately, they are interconnected, and the development of one can support the other, contributing to a child's overall school readiness (Hughes et al., 2022; Morrison & Brown, 2021; Sember et al., 2020). A child with well-developed fine and gross motor skills is more likely to engage actively in classroom activities, complete tasks independently and interact positively with peers, all of which are essential for academic development. According to Rosen and Johnson (2024), the synergy between fine and gross motor development supports broader cognitive, emotional and social development, which are critical for success in school and beyond.

3.3 Classroom variables associated with good child learning outcomes

Classroom quality is usually divided into two broad categories:

- **Structural quality variables,** which include the physical setting, teacher qualifications, group size and ratios, learning materials; and
- **Process quality variables,** including classroom interactions (teacher child and child child), pedagogical approaches, following the curriculum (Biersteker et al., 2016).

Research indicates that process quality, compared to structural variables, has a greater influence on child development (Rao et al., 2014; Sabol et al., 2013). As Torii et al. (2017) explain, it is through sustained and reciprocal interactions that educators foster children's communication skills, extend their thinking, develop their ability to manage emotions and relationships and instil the skills and confidence to be effective learners (Torii et al., 2017, 1).

3.3.1 Structural Quality Variables

There is mixed evidence of an association between teachers' qualifications and improved learning outcomes. Seven major studies found that teacher qualifications were not predictive of classroom and academic outcomes for children (Early et al., 2007), which was confirmed in recent South African research (Dawes et al., 2019). However, a recent review shows that quality measured on the ECERS-R is 'closely linked

to the level of staff qualification, which may indicate that it is important to have teachers with qualifications higher than secondary education working with young children' (Manning et al., 2017, 11).

With regard to the classroom environment, research shows that the availability of a range of learning materials in the classroom is associated with better child outcomes (Montie et al., 2006). Availability, accessibility and the developmental appropriateness of materials are important factors to consider.

3.3.2 Process Quality Variables

Play-based learning is increasingly recognised as an essential teaching practice in early childhood development due to its ability to support holistic growth across cognitive, social, emotional and physical domains. Through play, children actively engage with their environment, experiment with problem-solving and develop critical thinking skills in a natural and enjoyable way. Research has shown that play-based learning fosters language development, self-regulation and EF – key predictors of later academic success (Hirsh-Pasek et al., 2009; Whitebread et al., 2017). Moreover, this approach respects children's innate curiosity and encourages intrinsic motivation as children explore and construct knowledge through hands-on experiences. Socially, play promotes collaboration, negotiation and empathy as children interact with peers in structured and unstructured activities. Furthermore, the flexibility of play-based learning allows educators to tailor activities to individual developmental needs, supporting differentiated instruction in diverse classroom settings.

Developmentally supportive play includes play that is freely chosen by children, adult- guided play where adults scaffold child-led play, and adult-structured activities where the teacher designs, sets rules and scaffolds play with a particular learning objective (Edwards & Cutter-Mackenzie, 2013; Jensen et al., 2019; Pyle & Danniels, 2017; Zosh et al., 2018).

An important enabler for play-based learning is the relationship and interactions between the child and the teacher. Warm, supportive and encouraging relationships with caregivers facilitate the development of social and emotional skills associated with successful school transition (Hamre & Pianta, 2005). A **positive emotional climate** in the classroom enables children to confidently explore their environment and exercise their agency. It is important to assess the **child-teacher interactions** during a classroom observation and be able to score the degree to which these interactions support a positive emotional climate in the classroom. The emotional climate within a classroom setting is frequently highlighted as a significant factor influencing both social-emotional and academic learning outcomes (Wolf et al., 2018). Emotional climate as a construct within quality measures typically encompasses aspects such as the individualised attention provided by teachers, the use of positive reinforcement and praise, and observable expressions of positive emotions like enthusiasm and smiling (Pianta, Hamre & Allen, 2012). Additionally, components of pedagogy related to behaviour such as managing challenging behaviours and promoting prosocial actions are often included as integral elements of the emotional climate.

Another important component of play-based pedagogy is the inclusion of **child-initiated activities.** Incorporating more child-directed activities in early childhood education is essential for fostering engagement, autonomy, and meaningful learning experiences. Child-directed activities allow educators to tailor teaching to children's individual interests, creating a sense of relevance and excitement about learning. When children are given the opportunity to exercise **agency** in the classroom, making choices about their activities, exploring topics of interest and setting their own goals, they develop critical skills such as decision-making, problem-solving and self-regulation. Research shows that these experiences support deeper cognitive development as children are more motivated and actively engaged when they feel a sense of ownership over their learning (Ryan & Deci, 2000; Whitebread et al., 2012). Adair and colleagues

conceptualise agency as the capacity to influence and make decisions regarding what and how to learn, with the aim of broadening individual capabilities (Colegrove & Adair,2021). Research highlights that classroom activities emphasising children's agency consistently show significant correlations with improved learning outcomes (Baker, Le Courtois & Eberhart, 2021). Furthermore, child-directed approaches respect the diverse ways children learn and empower them to take an active role in their educational journey. By balancing structured guidance with opportunities for independent exploration, educators can create a learning environment that nurtures curiosity, creativity and a lifelong love of learning.

Connecting new learning to children's **prior knowledge** and experiences has been identified as a critical aspect of pedagogical quality in various educational contexts. Engaging children in recalling past events and experiences supports memory development, fosters a sense of self and enhances language skills (Reese et al., 1993). In a national study of preschools in Colombia, this practice was part of a key pedagogical quality factor associated with improvements in children's EF and emergent language skills (Maldonado et al., 2021). These findings underscore the importance of contextualising learning within children's lived experiences to promote cognitive, social and academic growth.

Other important aspects of quality, especially in low-income contexts, include balancing children's material and mental needs. This would include health and nutrition, safe drinking water, sanitation and hygiene (WASH) etc. These items are usually included in regulatory standards for ECCE facilities as is the case in Eswatini and are therefore not a priority for this tool. Dosage or the number of days and hours per week and years of enrolment are also predictors of child outcomes (Loeb et al., 2007; Nores et al., 2024; Wechsler et al., 2016).

3.3.3 Item Selection

Appendices 1 and 2 present our mapping of potential items for measuring child outcomes and classroom quality against domains and subdomains of the MoET Grade 0 Syllabus and ECCE guidelines.

For the child assessment, the most significant predictors of readiness for school in the Eswatini context have informed the draft selection. As agreed with the MoET team, the primary sources were the ELOM Social and Emotional Rating Scale, ELOM 4 and 5 (which has been standardised to 72 months) with additions from other sources including the ELOM-R (6 - 7 years) to fill the subdomain gaps. Some novel items were recommended for visual sequential memory, laterality and midline crossing.

The Engage Eswatini adaptation is the basis of the classroom quality assessment. However, as the focus is on teaching processes, there are a number of syllabus requirements which are not included and our proposal is to develop an environmental rating to cover any gaps.

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APPENDIX 1: CHILD OUTCOMES: SKILLS, MEASURES, CANDIDATE ITEMS AND SOURCES

Acronyms used

ASB	Aptitude Test for School Beginners
ASQ	Ages and Stages Questionnaire
CDAT	Cambodian Development Assessment Test
DCCS	Dimensional Change Card Sort
EAPCDS	East Asia Pacific Child Development Scales
EGMA	Early Grade Maths Assessment
EGRS	Early Grade Reading Study
ELDS	Early Learning Developments Standards
ELOM	Early Learning Outcomes Measure
ELOM-R	Early Learning Outcome Measure (Grade R)
ELOM SEF	Early Learning Outcome Measure Social & Emotional Functioning
HERBST	Herbst Early Childhood Development Criteria Test
IDELA	International Development and Early Learning Assessment
MODEL	Measure of Development and Early Learning
SACAS	South African Child Achievement Scales
SDQ	Strengths and Difficulties Questionnaire
TBCK-R	The Basic Concepts Knowledge- R.
WELA	Wordworks Early Literacy Assessment
ZAMCAT	Zambian Child Achievement Test

MoET GRADE 0 LEARNING AREA	ITEM TO BE PILOTED	ITEM SOURCES
SOCIAL AND EMOTIONAL		
Self Awareness	ELOM 4 & 5 Item 19: Ability to talk about own emotions (self-awareness): The child is asked to describe: a) what makes her/him feel sad and what can be done to feel better; b) what makes her/him feel happy. Also ELOM SEF Assessment of child's emotional functioning in the ECCDE context. (SACAS Scale).	IDELA – modified picture. Others using similar methods MODEL and EAPECDS. Items 18 and 19 are reliant on expressive language and in factor analysis have been loaded with language items. SACAS is based on the Child Behaviour Checklist.
Empathy and Caring	ELOM 4 and 5 Item 18: Response to a stimulus picture of girl crying. Child is asked to describe her feelings and actions to be taken to 'help her feel better'	
Social Interaction	ELOM SEF 1: Works well with peers (can wait for their turn/manage impulsivity). 2: Resolves problems with peers without becoming aggressive. 3: Cooperates with peers without prompting.	Child Trends.
Relationships	ELOM SEF child's relationships with familiar adults: 1: Child seeks out assistance or support from familiar adults. 2: Child seeks a familiar adult's ideas or explanations about events or experiences that are interesting to the child. 3: Child takes initiative in creating cooperative activities with a familiar adult.	California ELDS based. Desired Results Profile.
Work Ethics	ELOM 4 & 5 Assessor observation of the child during assessment. 1: Did the child pay attention to the instructions and demonstrations throughout the assessment? 2: Did the child stay concentrated and on-task during the activities and was not easily distracted? 3: Was the child careful and diligent on tasks? Was the child interested in accuracy? 4 Was the child interested and curious about the tasks throughout the assessment? Thrive by Five 2024 Items: Teacher rating on Task Focus and Following Instructions .	Selected from IDELA and ZAMCAT. SDQ.

MoET GRADE 0 LEARNING AREA	ITEM TO BE PILOTED	ITEM SOURCES
	Does the child get distracted easily or find it hard to concentrate? Does the child think before they do something? Does the child finish something they start? Is the child good at following instructions? Does the child follow rules in class? Does the child sit still when told to?	
CULTURAL HERITAGE		
Use of Language and Respect	Teacher rating: Child uses both hands to receive. Child greets elders appropriately.	Constructed for Eswatini.
PHYSICAL AND WELL BEING		
Balance and Stability	ELOM 4 & 5 Items 1, 2, 3, 4. 1: Stand on one foot (1 point for 3-9 seconds; 2 points for 4-10 seconds.). 2, 3, 4: Catch a beanbag thrown by examiner with: a) two hands against their body; b) preferred hand; c) other hand. Record preferred hand (laterality).	1: ASQ3- 5. 2, 3, 4: McCarthy Scales South African adaptation. Others using same or similar methods: Lesotho ELDS; CDAT; EAPECDS.
Body Awareness	ELOM 4 & 5: Child draws themself (see Eye Hand Coordination below) – Ask child to label the body parts drawn.	
Laterality	ELOM R: Name Writing (see Pre-writing below) Record whether the child crossed their midline during writing their name.	
Eye Hand Coordination	5: Use a pencil to copy curve and a square and circle combination. ELOM 4 & 5 6: Use a pencil to copy a triangle. 7: Use a pencil to draw self. 8: Strings beads in 40 seconds (total out of 10).	5 Bender Gestalt 11 Items 2 and adapted 6: Beery VMI. Others using same or similar methods: IDELA; EAP ECDS; ZAMCAT. 7: This item draws on scoring of EAP ECDS and IDELA. Others using or similar

MoET GRADE 0 LEARNING AREA	ITEM TO BE PILOTED	ITEM SOURCES
	Laterality and crossing midline observed.	methods: ASQ 3. 8: ZAMCAT. Others using same or similar methods: ASQ 3; EAP ECDS.
Personal Hygiene	ELOM SEF Can child use toilet on her/his own? Does child wash hands after using toilet?	Constructed for ELOM SEF. Constructed for Eswatini.
COGNITIVE		
Visual skills	Child copies a sequence of shapes from memory selecting from a stimulus card of 6 shapes. Trial 1 3 shape sequence, Trial 2 4 shapes, Trial 3 5 shapes. Laterality and crossing the midline observed.	Constructed for Eswatini.
Auditory skills	ELOM 4 & 5: Digits forward below. Language and Literacy skills below.	
Executive Functioning	ELOM 4 & 5 Item 14: Cognitive flexibility and working memory: Child sorts 6 cards according to: 1) colour; 2) shape. Dimensional Change Card Sort 1) Colour Game and 2) Shape Game. Item 15: Auditory discrimination, working memory and behavioural inhibition. Pencil Tapping Task: Child copies the examiner's exact sequence of taps on the table with a pencil. Item 16: Short term memory Digit Span (forward). IDELA. Item 17: Child demonstrates problem solving ability and working memory. Child assembles 7 puzzles of increasing levels of difficulty.	DCCS. Cards were changed from the original to a blue dog and a red car out of concern that rural children might not be familiar with boats and rabbits. Administration follows that laid down by Zelatso. Also used in EAP ECDS. ZAMCAT; Brooker, Okello et al. (2010); Others using similar methods EAP ECDS; Diamond & Taylor (1996). Digit Span Instructions based on the Children's Memory Scale. Others using same or similar

MoET GRADE 0 LEARNING AREA	ITEM TO BE PILOTED	ITEM SOURCES
		methods: MODEL and CDAT.
LANGUAGE AND LITERACY		
Listening	Digits forward (above). SEF follows instructions (above).	
Speaking	ELOM 4 & 5 Item 20: Child is able to describe what they do when they get up in the morning. Item 21: Child is asked to name items to be seen inside and outside at home. Item 22: Assessor reads a story and questions are asked to gauge understanding.	Items 20 and 21 were adapted for ELOM following pilot of IDELA and MODEL as these did not perform well. These items measure the same constructs and used the same format. 22: MODEL and IDELA.
Phonics	ELOM R Language: Item 2 Phonemic Awareness: Child identifies initial sounds, 6 trials ELOM R Language Item 3 Child asked to identify sounds of 12 common alphabet letters	Tayari, MODEL, ELOM 4 & 5. MODEL IDELA, EGRS, Tayari.
Pre reading	IDELA 16 Book Handling: Child asked to open book, identify where to start reading.	Similar items ELOM R book knowledge item.
Pre writing	Fine motor copying above. ELOM R Language Item 5: Name writing	EAPCDS, TBCK-R, WELA.
NUMERACY AND MATHEMATICS		
Counting	ELOM 4 & 5 Item 9: Counting in Classes: Child counts items from a mixed presentation of marbles, button and sticks.	Modification of IDELA item using three classes of object. Others using similar methods MODEL, EAPECDS.
Number symbols and names	IDELA Item 5: Number ID: Child identifies randomly arranged number names from chart.	Adapt to include only 1 – 10.

MoET GRADE 0 LEARNING AREA	ITEM TO BE PILOTED	ITEM SOURCES
Problem solving - word problems	ELOM R Mathematics Item 12: Addition and Subtraction Trials 1 and 3 ELOM R Mathematics Item 13: Items Sharing and grouping Trials 1 and 2.	Herbst, EAP CDS, IDELA, Tayari, Wright et al. (2006).
Patterns	ELOM R Item 17: Pattern Extension. Task: A pattern strip (with multi-colour and size shapes arranged in a particular order). The child uses shapes to complete the pattern in the correct sequence.	Similar items in EAPCDS, ASB spatial scale.
Measurement	ELOM 4 & 5 Item 13: Child identifies biggest, smallest longest and shortest from picture stimulus.	IDELA and MODEL.
Shape and Space	ELOM 4 & 5 Item 12: Location Vocabulary. Child identifies objects in a picture above, under, in front of, on the side.	IDELA and MODEL.
Data handling	ELOM R Mathematics Item 5: Sorting And Grouping: Sort the objects. Task: Child is asked to group triangles, squares and circles by 1) shape; 2) size and 3) colour.	EAPCDS. Similar items in ELOM 4 & 5, IDELA , HERBST.

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APPENDIX 2: CLASSROOM MEASURE

https://docs.google.com/spreadsheets/d/1SqhoheVtMo3hi5sHI0OIzUT2XqcyccuTnMZIxS8iUaU/edit?usp=sharing