

**UNIVERSITY OF EDUCATION, WINNEBA**



**USING ACADIENCE LEARNING ONLINE (ALO) TO SUPPORT THE  
TRANSITION TO ENGLISH (T2E) INTERVENTION IN IMPROVING  
BASIC THREE LEARNERS' LITERACY SKILLS AT NII SOWAH DIN  
SCHOOL, ACCRA**

**NANCY SWATSON**

**MASTER OF PHILOSOPHY**

**2025**

**UNIVERSITY OF EDUCATION, WINNEBA**



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**NANCY SWATSON  
(8240150036)**

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in partial fulfillment of the requirements for the award of the degree of  
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FACULTY OF APPLIED BEHAVIOURAL SCIENCES IN EDUCATION  
UNIVERSITY OF EDUCATION, WINNEBA**

**DECEMBER, 2025**

## DECLARATION

### Student's Declaration

I, **Nancy Swatson**, declare that this thesis, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole, for another degree elsewhere.

**Signature:** .....

**Date:** .....

### Supervisor's Declaration

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of thesis/dissertation/project as laid down by the University of Education, Winneba.

**Name of Supervisor: Dr. Florence Mensah**

**Signature:** .....

**Date:** .....

## **DEDICATION**

I dedicate this work to my family- both nuclear and extended- and friends for their enormous support during my studies at UEW.

## ACKNOWLEDGEMENTS

First and foremost, I give all glory and honour to Almighty God, whose grace, wisdom, and strength have sustained me throughout this academic journey. Without His guidance and provision, this work would not have been possible.

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## ABSTRACT

Early-grade literacy challenges persisted in Ghana, with national assessments indicating that a majority of Basic Three learners performed below expected benchmarks in decoding, fluency, and comprehension. At Nii Sowah Din Basic School, baseline ASER (Annual Status of Education Report) assessments, a foundational literacy tool measuring letter recognition, word reading, and paragraph comprehension, revealed that all learners were below benchmark at the start of the study. This study therefore investigated the integration of Acadience Learning Online (ALO), a real-time digital progress monitoring system, within the Transition to English (T2E) framework to improve literacy skills among eight Basic Three learners. The T2E framework is a structured bilingual literacy programme designed to support learners' transition from mother-tongue instruction to English through explicit phonics, vocabulary development, fluency practice, and comprehension instruction. The study was grounded in the Simple View of Reading (SVR), which conceptualises reading comprehension as the product of decoding and linguistic comprehension, and operationalised through the Multi-Tiered System of Supports (MTSS) and the Gradual Release of Responsibility (GRR) models to scaffold and intensify instruction based on learner need. Using a pragmatic action research design over six weeks, quantitative data were collected through ALO measures of Oral Reading Fluency (ORF-WC), accuracy, retell, and composite scores, alongside ASER baseline data. Findings showed measurable gains: mean ORF-WC increased from 21.27 to 33.38 words per minute; accuracy improved from 48.1% to 62.6%; and composite literacy scores rose from 48.06 to 86.69. Tier 2 and Tier 3 learners demonstrated differentiated growth trajectories, with intensive support yielding steady incremental gains. Qualitative findings revealed improved instructional grouping, enhanced teacher data literacy, more targeted phonics delivery, and increased learner engagement and confidence. However, challenges related to internet connectivity, teacher workload, and sustainability were reported. The study recommended institutionalising digital progress monitoring within MTSS frameworks, strengthening teacher capacity in data interpretation, scaling ALO-supported T2E implementation across non-GALOP schools, and investing in infrastructure to ensure long-term sustainability. The findings suggested that integrating theoretically grounded scaffolding models with real-time digital monitoring can significantly enhance early-grade literacy instruction in low-resource Ghanaian contexts.

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background to the Study

Literacy remains a cornerstone of personal, social, and economic development, serving as the foundation for lifelong learning and critical thinking. It involves the ability to identify, understand, interpret, create, and communicate meaning through written and spoken language (UNESCO, 2022). Despite its centrality to human capital development, global literacy levels remain alarmingly low. According to UNESCO (2022), over 773 million young people and adults lack basic literacy skills, with sub-Saharan Africa recording the highest illiteracy rates. This barrier significantly hampers economic growth, social mobility, and civic participation.

In Ghana, literacy acquisition poses enduring challenges. The Early Grade Reading Assessment (EGRA) and USAID (2021) reports consistently reveal that only about 10% of Primary Three learners achieve minimum proficiency in reading comprehension, reflecting significant gaps in decoding, fluency, and vocabulary. These challenges are evident in schools such as Nii Sowah Din Basic School, which implements the Transition to English (T2E) programme; a structured bilingual literacy initiative designed to strengthen phonics, fluency, vocabulary, and comprehension during the shift to English instruction. However, the school operates outside the Ghana Accountability for Learning Outcomes Project (GALOP), a World Bank supported reform programme that provides selected low-performing schools with funding, teacher training, instructional materials, and digital assessment tools. As a non-GALOP school, Nii Sowah Din delivers literacy instruction without these additional systemic supports. Consequently, the school functions with limited

financial and instructional support, often hindering the fidelity of teaching practices and access to pedagogical resources (Ghana Education Service [GES], 2022; USAID, 2023). Although initiatives like T2E and the National Accelerated Literacy Programme (NALAP) have sought to improve early-grade literacy through language transition and foundational reading instruction, their long-term impact is constrained by the absence of systematic, real-time monitoring mechanisms. Many schools struggle to sustain progress once direct project support ends, primarily because teachers lack timely data on learner performance, which makes it challenging to adapt instruction to students' varied needs and leads to a persistent mismatch between teaching approaches and literacy outcomes (GES, 2022).

Within this context, digital monitoring tools such as Acadience Learning Online (ALO) present valuable opportunities for data-informed instruction. ALO is a digital platform designed to assess students' reading and foundational literacy skills through frequent, curriculum-based measures. It provides instant feedback and longitudinal tracking, enabling educators to identify learning gaps, plan targeted interventions, and systematically monitor student progress (Acadience Learning, 2021). Empirical studies in the United States, South Africa, and Kenya demonstrate that digital learning and monitoring tools, when effectively integrated, enhance reading fluency and early literacy outcomes by supporting responsive teaching (Fuchs & Fuchs, 2006; Piper et al., 2018). However, the adaptation and effectiveness of such tools in low-resource, Ghanaian school contexts are not well documented, creating a knowledge gap that demands investigation.

## **1.2 Statement of the Problem**

National literacy data continue to highlight a persistent reading crisis in Ghana. According to the 2023 USAID Early Grade Reading Assessment (EGRA), over 60% of learners in Primary Two are unable to read a single English word, signaling widespread early-grade reading failure (USAID, 2023). This situation undermines equitable access to the curriculum and limits learners' long-term academic achievement.

At Nii Sowah Din Basic School, this challenge is even more pronounced. As a non-GALOP school with limited external support, the institution operates without consistent digital monitoring systems or reliable formative assessment tools. The absence of the use of digital solutions has weakened teachers' ability to obtain real-time feedback for instructional decision-making (GES, 2022; USAID, 2019).

Although national initiatives such as the Transition to English (T2E) programme have yielded modest literacy gains in some schools, their impact at Nii Sowah Din has not been sustained. Baseline school data revealed that 100% of learners performed below national reading benchmarks, indicating a systemic Tier 1 instructional failure that demands class-wide intervention rather than isolated remediation. (ASER baseline records, Nii Sowah Din, 2024) Teachers also report ongoing difficulties diagnosing individual reading components, such as phonemic awareness, decoding, or fluency, leading to uniform, whole-class strategies that fail to address learners' diverse literacy needs.

The problem, therefore, lies in two interrelated gaps. First, the lack of structured, digital progress-monitoring tools prevents timely and data-driven instructional adjustments. Second, there is a limited empirical evidence base on how such digital

progress-monitoring systems can be effectively implemented in low-resource Ghanaian primary schools (Fuchs & Fuchs, 2006; USAID, 2023).

Without frequent, systematic assessment and actionable feedback, teachers remain unable to tailor instruction to learners' needs. Consequently, pupils at schools like Nii Sowah Din continue to lag in foundational literacy. Investigating the potential of Acadience Learning Online (ALO) as a structured digital assessment tool provides valuable insights into how data-informed feedback loops enhance early literacy instruction and improve reading outcomes within Ghana's national education framework.

### **1.3 Purpose of the Study**

The purpose of this study was to examine the effectiveness of integrating Acadience Learning Online (ALO) as a real-time digital progress monitoring tool within the Transition to English (T2E) instructional framework to improve decoding, fluency, and comprehension skills among Basic Three learners at Nii Sowah Din Basic School in Accra.

### **1.4 Objectives of the Study**

This study sought to:

1. Assess the use of Acadience Learning Online (ALO) to track and improve Basic Three learner's decoding, fluency and comprehension skills.
2. Determine the extent to which personalised interventions, enhance reading fluency and comprehension outcomes for Basic Three students.
3. Identify the challenges and successes experienced by teachers and students during the implementation of ALO and evaluate how these factors influence the effectiveness of literacy interventions.

### **1.5 Research Questions**

1. How effective is the use of Acadience Learning Online (ALO) in improving Basic Three students' decoding, fluency, and comprehension skills?
2. To what extent does the integration of the Transition to English intervention (T2E) with ALO improve reading fluency and comprehension among Basic Three students?
3. A. What challenges and successes are encountered by teachers and students during the implementation of ALO  
  
B. How do these factors impact literacy outcomes?

### **1.6 Significance of the Study**

This study is significant because it provided teachers at Nii Sowah Din Basic School with real-time, data-driven insights into their students' literacy skills, enabling targeted, personalised interventions that improved decoding, fluency, and comprehension. By using digital monitoring tools like ALO, teachers made informed instructional decisions, optimised learner grouping, and adjusted teaching strategies to meet individual needs. For learners, this meant more engaging, responsive instruction that built confidence and reading proficiency, especially during the critical Basic Three transitional stage. Ultimately, this research could offer a scalable model for under-resourced schools to enhance literacy outcomes, contributing practical solutions to systemic challenges in Ghana's education system.

### **1.7 Delimitation**

While the study provides valuable insights into data-driven literacy practice, its scope was delimited to a single school context (Nii Sowah Din School) and a short-term monitoring period of six weeks. The study focused on English language proficiency

through the T2E programme. The study was delimited to the ALO as its only digital monitoring tool. Broader factors such as socioeconomic background, home literacy environment, and national infrastructure constraints were excluded.

### **1.8 Limitations of the Study**

The study's limitations include its narrow scope, as it was conducted in only one public primary school, limiting the generalizability of the findings to other contexts. The short duration of the six-week intervention may not adequately reflect the long-term effectiveness of digital progress monitoring on literacy outcomes. Additionally, excluding broader factors such as socioeconomic background, home literacy environment, and national infrastructure constraints may overlook significant influences on student learning. The focus on Basic Three learners limits insights applicable to other grades, while variability in teacher competence may have affected the results. Differences in technological readiness and classroom support levels were also unassessed variables that could affect the intervention's effectiveness.

Furthermore, the reliance on specific instruments for data collection may not capture all relevant aspects of literacy development, and self-reported data from teachers could introduce bias. Finally, the findings are based on a single intervention cycle, limiting conclusions regarding the sustainability of observed literacy improvements over time. Despite the limitations outlined, the research findings and conclusions were not compromised due to strict adherence to all protocols for the methods used.

### **1.9 Operational Definition of Terms**

*Literacy*: refers to the Basic Three learners' ability to decode, read fluently, and understand English texts. It is measured using ALO and supported by the T2E) interventions.

***Literacy Skills:*** Literacy skills refer to Basic Three learners' measurable decoding and linguistic comprehension abilities as defined by the Simple View of Reading (SVR). These include phonemic awareness, decoding, fluency, vocabulary, and comprehension. Instruction is scaffolded through GRR and differentiated within MTSS, and measured using ALO indicators (ORF-WC, accuracy, Maze, retell, composite scores).

***Literacy Outcomes:*** Literacy outcomes refer to documented growth in literacy skills over time, evidenced by pre- and post-intervention ALO and ASER scores. Within MTSS, outcomes indicate responsiveness to tiered support; within GRR, increased reading independence; and under SVR, improved integration of decoding and comprehension.

***Digital Data Monitoring Tools:*** refers to an interactive platform for tracking and analysing students' literacy progress. It integrates assessments, progress tracking, and feedback loops for targeted literacy interventions. The primary tool used in this research is ALO.

***Reading Proficiency:*** is defined as a student's ability to decode text, read fluently, and comprehend material, measured through ALO. The assessment focuses on key literacy skills essential for reading development and academic success. There are five key literacy skills on which ALO hinges. Research shows these skills significantly affect outcomes (Kaminski, 2021). These are:

1. Phonemic Awareness
2. Fluency
3. Vocabulary and oral language

4. Decoding (Measured as Alphabetic Principle in ALO)
5. Comprehension

***Transition to English (T2E) Programme:*** The T2E is a bilingual program to transition young learners from local to English literacy by teaching core skills - decoding, phonics, fluency, and comprehension - that ensure English proficiency through structured strategies and progress monitoring with ALO.

***Personalised Literacy Interventions:*** This research defines personalised literacy intervention as targeted, data-driven strategies for specific literacy gaps in Basic Three. ALO-guided interventions are activity-based, focusing on decoding, fluency, and comprehension.

***Phonics-Based Instruction:*** This instruction emphasises teaching letter-sound correspondence for better decoding. Lessons use T2E models and are monitored through ALO.

***Progress Monitoring:*** Progress monitoring refers to systematically and continuously tracking students' literacy development using bi-weekly assessments via ALO. The core element of this contextual definition is assessment frequency, which enhances effective monitoring and data analysis to observe trends and inform instructional adjustments.

***Bilingual Literacy Instruction:*** An instructional approach that develops literacy in local language and English. Transition is scaffolded through T2E and monitored via ALO. In this research, bilingual literacy instruction uses local language (Twi) to support literacy, ensuring learners grasp key concepts to improve outcomes.

***Acadience Learning Online ALO:*** Within the Context of this research, ALO will be defined as the digital tool that assesses and monitors literacy skills outcomes of year three basic learners by tracking, analysing, and providing real-time feedback on students' literacy progress. The tool identifies literacy gaps and guides instructional decisions through frequent assessments.

***Explicit Instruction:*** Teachers model reading strategies during guided practice sessions.

***Guided Practice:*** Collaborative activities where students practice skills under teacher guidance.

***Independent Practice:*** Students apply learned skills independently, with performance tracked through ALO.

***Feedback Loop:*** Real-time feedback informs when to transition between stages of responsibility.

***Decoding Skills:*** operationally defined as the ability to translate printed symbols (letters) into their corresponding spoken sounds to form words. In this research, decoding proficiency is tracked using phonics-based assessments within ALO. The core components will be the recognition of letter-sound correspondence, blending these sounds to form words and tracking to ensure progress.

***Reading Fluency:*** operationally defined as the ability to read connected text with speed (words read per minute -WPM), accuracy (The correct pronunciation of words), and prosody (proper expression relating to appropriate intonation and phrasing when reading aloud). It is assessed through bi-weekly monitoring using ALO.

**Benchmark Assessment:** This will be periodic evaluations of learner progress at key intervals in ALO to monitor literacy standards from the T2E programme. Baseline assessments will establish initial literacy levels. Evaluations will occur at defined intervals to monitor progress. Growth will be measured by comparing current performance with previous benchmarks.

**Data Dashboard:** A user-friendly interface within ALO that provides visual displays of literacy performance metrics, enabling teachers and administrators to make data-driven decisions. This dashboard has unique features that track intervention decisions to achieve outcomes:

**Visual Data Representation:** Charts and graphs showing progress in decoding, fluency, and comprehension.

**Individual and Group Data:** Allows for monitoring of individual student performance and overall class trends.

**Customisation Views:** This enables teachers to filter and sort data based on specific literacy objectives.

**Pathways of Progress:** The Pathway of Progress in Acadience Learning Online (ALO) is designed to help educators set progress monitoring goals and evaluate student performance. This feature includes projections, end-of-year goals, aimlines, and benchmark goal information, allowing users to visualise student progress effectively.

**Acadience Reading K-6:** Acadience Reading K-6 is operationally defined as a comprehensive assessment system designed to measure the development of reading skills in students from kindergarten through basic six. This system evaluates core

components of literacy development, including phonemic awareness, decoding, **fluency, and comprehension.**

*Acadience survey:* Acadience survey is a diagnostic tool used for identifying gaps in reading skills for targeted interventions. It provides baseline data and highlights areas needing support. The core components are to validate initial data and establish intervention starting points.

*National Literacy Acceleration Programme (NALAP):* NALAP is operationally defined as a government-initiated program aimed at improving literacy outcomes in Ghana by promoting mother-tongue instruction in early grades and gradually transitioning students to English literacy. The program emphasises bilingual literacy development.

*Ghana Education Service (GES):* is defined as the governmental body responsible for implementing educational policies, programs, and curricula across Ghana. Within the Context of this research, GES provides oversight, teacher training, and resources for implementing literacy improvement initiatives.

*Ghana Accountability for Learning Outcomes Project (GALOP):* A Ghana initiative supported by the World Bank that aims to improve learning in underperforming schools through resources, teacher training, and accountability. GALOP is relevant here, as Nii Sowah Din is a non-GALOP school that relies on external tools, such as ALO, for monitoring.

*Multi-Tiered System of Supports (MTSS):* A school-wide framework for providing academic and behavioural support across three tiers: (1) universal instruction for all learners, (2) targeted interventions for students not meeting benchmarks, and (3)

intensive, individualised interventions. In this study, MTSS serves as the guiding framework for tailoring literacy instruction using ALO data.

***Response to Intervention (RTI)***: An evidence-based model in MTSS that emphasises early identification of struggling learners, continuous monitoring, and tiered intervention. In this research, RTI is operationalised through ALO for screening, diagnosis, and the provision of literacy interventions for Basic Three students.

### **1.10 Organisation of Study**

The study is organised under five chapters. Chapter one covers the background to the study, the research problem, the objectives of the study and related research problems. It further highlights the study's significance and purpose, and outlines the delimitations and limitations of the research. The operational definitions of terms were captured in this chapter. Chapter two featured the theoretical underpinning of the study, the relevant literature that was reviewed, and the conceptual framework that was derived from the study. Chapter three elaborated on the methodology used for the study. This includes the research approach, research design, population and sampling procedures, instruments used in the study, pre-intervention procedures, intervention procedures, data collection procedures, and data analysis. Chapter four captures the results and outcomes of the research; Chapter five discusses the findings; and the final chapter provides a summary, conclusions, and recommendations based on the findings.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0 Overview**

This chapter examined key theories underpinning the study. It synthesised evidence from relevant literature theoretically, conceptually, and empirically.

#### **Theoretical Framework**

1. The Simple View of Reading (SVR)
2. Instructional and Scaffolding Models
3. Gradual Release of Responsibility
4. Multi-Tiered Systems of Support (MTSS) and Response to Intervention (RTI) frameworks.

#### **Conceptual and Empirical Review**

1. Impact of Digital Assessment, Progress Monitoring and Data-Driven Instruction
2. Early-Grade Literacy Outcomes
3. Bilingual Literacy & T2E Programme Effectiveness
4. MTSS/RTI Literacy Interventions in Low-Resource Schools
5. Teacher Use of Performance Data

#### **Conceptual Framework**

##### **2.1 Theoretical Framework**

###### **2.1.1 Simple View of Reading**

This study is anchored on the Simple View of Reading (SVR), a widely recognised model that conceptualises reading comprehension as the product of two fundamental

components: decoding and linguistic comprehension. According to Gough and Tunmer (1986), later expanded by Hoover and Gough (1990), compelling reading requires both the ability to convert printed text into oral language and the capacity to understand spoken language. Any deficit in either component undermines reading fluency and comprehension. This view provides a robust foundation for designing and evaluating reading interventions by clearly identifying where instructional support should be targeted.

Aligned with SVR, the National Reading Panel (2000) outlines five essential pillars of reading: phonemic awareness, phonics, fluency, vocabulary, and comprehension, emphasising the need for systematic instructional support and ongoing assessment. For Ghanaian learners transitioning from early grade instruction in local languages to English literacy, the Transition to English (T2E) programme provides a structured pathway. It strengthens decoding skills through phonics while advancing oral language and vocabulary development, thereby supporting both components of the SVR model. Since the mastery of these foundational skills varies among learners, continuous progress monitoring remains critical for ensuring timely instructional adjustments.

To enhance the precision and responsiveness of reading interventions, this study integrates digital data-monitoring tools, specifically ALO. ALO provides real-time analytics on learners' decoding, fluency, and comprehension skills, enabling educators to track trends, identify learning gaps, and adjust instructional pacing. As emphasised in the original framework, effective literacy instruction requires reliable tools that capture learners' strengths and weaknesses in decoding and language comprehension. ALO offers a practical solution by linking assessment outcomes directly to targeted

instructional decisions. This aligns with international best practices for data-driven literacy improvement and supports sustainable educational strategies in resource-constrained contexts.

In the context of Basic Three learners at Nii Sowah Din School, integrating SVR with digital data monitoring is particularly relevant. At this stage, learners are expected to transition from "learning to read" to "reading to learn", making timely identification of decoding and comprehension challenges essential. By overlaying SVR-aligned instruction with real-time ALO data, teachers can more effectively tailor interventions, whether reinforcing phonics for struggling decoders or enhancing vocabulary and oral language for learners exhibiting comprehension weaknesses.

Furthermore, insights from the T2E programme strengthen this framework by demonstrating how structured phonics instruction, vocabulary development, and consistent assessment can improve literacy outcomes across diverse Ghanaian classrooms. The incorporation of ALO into this ecosystem supports the development of sustainable, scalable monitoring systems that can be replicated across similar educational settings.

In summary, this theoretical framework positions the Simple View of Reading as the conceptual foundation for understanding the core literacy skills required at Basic Three. It integrates digital data monitoring through ALO as a practical tool for operationalising progress tracking and intervention planning. When combined with strategies from the T2E programme, this approach offers a theoretically grounded and contextually relevant framework for enhancing literacy outcomes among Ghanaian learners.

Empirical evidence also supports the relevance of SVR in guiding digital monitoring and targeted reading interventions. For instance, Kim et al. (2021) applied the SVR framework within a digital progress-monitoring system used in early-grade classrooms in the United States. Their study demonstrated that digital tools that track decoding and language comprehension can accurately predict reading outcomes. Importantly, teachers who relied on these digital insights to modify their instruction achieved significantly better improvements in learners' reading fluency and comprehension. This finding reinforces the value of using a tool like ALO to operationalise SVR in real-time classroom contexts.

Similarly, in Sub-Saharan Africa, Cabell et al. (2020) examined early-grade literacy interventions grounded in SVR across schools in Kenya and Uganda. Their research revealed that interventions that systematically addressed decoding and oral language development produced substantial gains in learners' reading performance. Moreover, they found that continuous assessment and learner-tracking mechanisms enhanced teachers' ability to provide differentiated support. This evidence is particularly relevant to the current study, as it demonstrates that SVR-informed interventions, especially when paired with ongoing progress monitoring, are effective in educational environments comparable to those in Ghana.

Taken together, the theoretical and empirical insights highlight the importance of combining SVR-based instructional approaches with digital data monitoring to enhance literacy outcomes. By integrating the SVR framework, insights from the T2E programme, and real-time monitoring via ALO, this study establishes a strong, contextually appropriate foundation for improving reading proficiency among Basic Three learners at Nii Sowah Din School. The framework, therefore, positions digital

progress monitoring as not only a technological innovation but also a pedagogically sound approach grounded in a well-established reading theory.

## **2.2. Instructional and Scaffolding Models**

Instructional and scaffolding models provided teachers with structured approaches for supporting learners as they developed increasingly complex literacy skills. In the context of improving the reading performance of Basic Three students at Nii Sowah Din School, these models offered clear pathways for delivering differentiated, evidence-based instruction. Two central models underpin this study: the Gradual Release of Responsibility (GRR) and the Multi-Tiered Systems of Support (MTSS), together with Response to Intervention (RTI), as both frameworks facilitate the integration of digital data monitoring tools such as Acadience Learning Online (ALO) into literacy instruction. Through these models, teachers are equipped to scaffold learning, identify instructional needs, and apply targeted interventions grounded in real-time learner performance.

### **2.2.1 Gradual Release of Responsibility (GRR) model**

The Gradual Release of Responsibility (GRR) model provides a systematic instructional sequence that moves learners from teacher-led demonstration to guided practice and, eventually, to independent application. Originating from the work of Pearson and Gallagher (1983), GRR is organised into the phases "I Do," "We Do," "You Do Together," and "You Do Alone," each designed to support learners as they consolidate new literacy skills. This model is particularly relevant for Basic Three learners, who must transition from decoding skills established in earlier grades to more advanced comprehension tasks. When applied within Ghana's Transition to English (T2E) programme, the GRR model helps strengthen phonics, vocabulary, and

oral language skills, which are core elements necessary for reading proficiency. Significantly, integrating ALO enhances the effectiveness of GRR by providing teachers with real-time data indicating when learners are ready to transition between phases. By tracking decoding accuracy, fluency rates, and comprehension indicators, teachers can make informed decisions about whether a learner requires further modelling, additional guided practice, or increased opportunities for independent application.

### **2.2.2 Multi-Tiered Systems of Support (MTSS) and Response to Intervention (RTI) frameworks**

Complementing the GRR model is the Multi-Tiered Systems of Support (MTSS) framework, supported by Response to Intervention (RTI). MTSS provides a structured, tiered approach to literacy support, allowing educators to differentiate instruction based on learner needs. Tier 1 represents universal instruction provided to all students, Tier 2 offers targeted small-group interventions for those demonstrating emerging weaknesses, and Tier 3 delivers intensive, individualised support for learners with persistent reading challenges. RTI operates within this system by emphasising early identification, frequent screening, and ongoing progress monitoring to ensure timely, responsive interventions. Within the Ghanaian context, where national assessments continue to show wide disparities in foundational literacy achievement, MTSS and RTI offer strategic responses to the instructional gaps present in many lower primary classrooms.

Digital monitoring tools such as ALO significantly strengthen the operationalisation of MTSS/RTI. ALO provides continuous, reliable data that help teachers identify struggling readers promptly, determine appropriate tier placement, and assess the

effectiveness of interventions. In resource-constrained classrooms, the availability of such data is critical for shifting from reactive remediation to proactive, targeted instructional support. For schools like Nii Sowah Din, where students often enter Basic Three with varying literacy competencies, ALO enabled teachers to monitor learning trajectories, adjusted instruction, and intervened before reading difficulties become entrenched.

When considered together, the GRR and MTSS/RTI models create a coherent, integrated system for enhancing literacy outcomes. GRR guides how instruction is delivered, ensuring that learners receive explicit modelling and scaffolded practice. MTSS and RTI organise the intensity and structure of support according to individual learner needs. ALO then supplies the data necessary for informed decision-making within both models. This synergy ensures that reading instruction is not only explicit and scaffolded but also responsive and data-driven. Moreover, embedding these models within the broader goals of the T2E programme supports the development of sustainable literacy practices that align with Ghana's educational reforms. Through this integrated framework, the study seeks to evaluate how digital monitoring, combined with structured instructional and intervention models, can enhance literacy outcomes for Basic Three learners in a practical and scalable manner.

Empirical evidence further supports integrating these models into literacy improvement efforts. Fisher and Frey (2014) conducted a study examining the effectiveness of the GRR model in early literacy classrooms in the United States. They found that learners who received instruction sequenced through GRR phases demonstrated significant gains in reading fluency and comprehension. Their results showed that explicit modelling followed by scaffolded practice was most effective

when teachers had access to timely assessment data to determine learner readiness for independent reading tasks. This finding aligns with the present study's emphasis on using ALO to guide instructional transitions within the GRR model.

Similarly, Al Otaiba et al. (2014) evaluated the application of MTSS/RTI frameworks across diverse elementary schools, demonstrating that when teachers used frequent progress-monitoring data to plan and adjust interventions, struggling readers experienced accelerated growth in foundational reading skills. Their study emphasised the importance of data-driven decision-making in determining tier placement and intensifying supports for learners who did not respond adequately to initial instruction. The integration of ALO in the current study functions in the same way, offering teachers a reliable tool for monitoring learner progress and adjusting tiered interventions accordingly.

Taken together, the GRR and MTSS/RTI frameworks create a coherent and responsive instructional environment in which digital data monitoring plays a central role. GRR ensures that reading instruction is systematically scaffolded; MTSS/RTI guarantees that learners receive support that matches their level of need; and ALO supplies the real-time data that underpins instructional decision-making within both models. When viewed alongside the goals of the T2E programme, this integrated framework provides a sustainable, evidence-based approach to enhancing literacy outcomes for Basic Three learners at Nii Sowah Din School, making it highly suitable for the Ghanaian educational context.

## **2.3 Conceptual and Empirical Review**

### **Impact of Digital Assessment, Progress Monitoring, and Data-Driven Instruction**

#### **2.3.1 Digital Assessment**

Digital assessment has become a central tool for improving early-grade literacy, especially in multilingual and low-resource learning contexts. Conceptually, it refers to the use of technology-enabled platforms to evaluate learners' literacy skills, generate instantaneous feedback, and store performance data for instructional use (Kaminski et al., 2018). Unlike traditional paper-based systems, digital assessments, such as ALO, provide automated scoring, real-time dashboards, and efficient storage of learner data, enabling teachers to make timely instructional decisions. These features support the diagnostic, formative, and summative purposes of assessment in ways that are particularly well-suited to the fast-changing literacy needs of early-grade learners.

Furthermore, the effectiveness of digital assessment is shaped by elements such as technical adequacy, feedback speed, and usability. Valid and reliable tools are essential to ensuring that data accurately reflect learners' abilities (Stecker et al., 2008). ALO, which is grounded in curriculum-based measurement (CBM), has demonstrated strong predictive validity for decoding and oral reading fluency, both of which are foundational indicators of early literacy growth. For teachers in contexts like Ghana, where assessment is often infrequent and manually intensive, digital tools also reduce workload and increase assessment frequency, making the instructional cycle more responsive.

Empirical research supports these conceptual benefits. Kaminski et al. (2018) found that digital CBM assessments yield reliable data that help teachers identify learners'

needs with greater precision. Similarly, Piper et al. (2018) observed in a Kenyan digital assessment pilot that tablet-based assessments improved teachers' ability to detect literacy challenges and differentiate instruction. In South Africa, Moodley and Blease (2022) documented increased decoding and fluency gains among learners whose teachers used digital assessment systems. These findings collectively establish digital assessment as a practical and effective tool for enhancing literacy decision-making, thereby reinforcing the relevance of ALO to the current study.

### **2.3.2 Progress Monitoring**

Progress monitoring is the systematic, repeated assessment of learners' reading skills to track growth and determine whether instruction is effective (Fuchs & Fuchs, 2006). Conceptually, this process relies on collecting frequent data points that reflect incremental changes in decoding, fluency, and comprehension. Measures such as Oral Reading Fluency (ORF), accuracy, and Maze comprehension scores, core features of ALO, are susceptible to early reading growth and therefore essential for instructional adjustment.

A key principle in progress monitoring is frequency. Weekly or bi-weekly checks enable teachers to detect stagnation early and modify interventions before learners fall significantly behind. Decision rules and benchmark thresholds further guide teachers in determining when to intensify support, especially within MTSS/RTI systems (Goodman & McIntosh, 2016). Thus, progress monitoring is not merely a record-keeping exercise; it is an instructional mechanism that drives real-time adaptation.

Empirically, the value of progress monitoring is well-established. Fuchs and Fuchs (2006) demonstrated that sustained progress monitoring significantly improves reading outcomes by enhancing alignment between instruction and learner needs.

Stecker et al. (2008) similarly reported that classrooms using frequent CBM-based monitoring made larger reading gains than those relying on periodic assessments. Within African contexts, Cilliers et al. (2020) found that teachers who used digital progress data in South Africa were more likely to adjust instruction and group learners effectively. Piper et al. (2018) also documented substantial fluency improvements when Kenyan teachers monitored progress bi-weekly.

### **2.3.3 Data-Driven Instruction**

Data-driven instruction refers to the use of assessment information such as fluency rates, accuracy trends, and comprehension measures to plan, differentiate, and adjust teaching strategies (Hamilton et al., 2009). Within this conceptual framework, teachers employ assessment data to identify learning gaps, form flexible instructional groups, adjust pacing, and select appropriate instructional materials. Digital platforms such as ALO enhance this process by providing visual dashboards, growth charts, and automated risk classifications, thereby reducing teachers' cognitive load and improving data interpretation.

Central to data-driven instruction is teacher data literacy, which includes the ability to analyse trends, interpret error patterns, and match learner needs to instructional strategies (Gummer & Mandinach, 2016). Effective use of data also requires instructional adaptation, such as increasing phonics dosage, restructuring reading groups, or introducing additional fluency practice for learners with persistent difficulties. When embedded in instructional frameworks such as the Gradual Release of Responsibility (GRR) or MTSS/RTI, data-driven instruction becomes even more potent because data determine when learners move from guided to independent tasks or when they require more intensive support.

Empirical evidence consistently underscores the importance of data-driven teaching. Hamilton et al. (2009) found that teachers who regularly engaged with assessment data implemented more effective reading instruction and achieved stronger learner outcomes. Jimerson (2016) also observed that teacher confidence in interpreting assessment data was strongly associated with improved learner performance, especially in early literacy. In South Africa, Cilliers et al. (2020) demonstrated that digital data-informed coaching improved reading outcomes by enabling teachers to target learners' specific skill deficits.

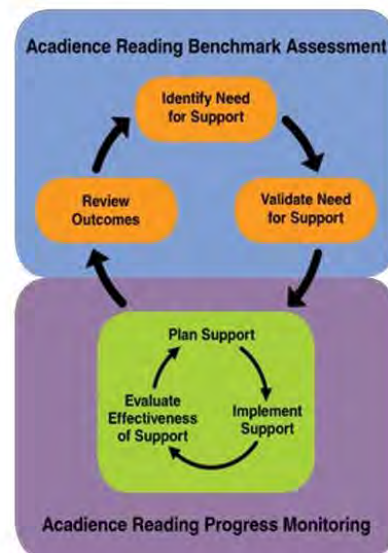
In Ghana, however, the empirical picture is different. Studies by Ampiah et al. (2018) and USAID (2019) reveal that teachers rarely use assessment data to adjust instruction, mainly due to limited training, large class sizes, and reliance on infrequent paper-based assessments.

### **Outcomes-Driven Model in Literacy Interventions**

The Outcomes-Driven Model (ODM) is a foundational framework utilised within the Acadience suite of tools, including the Acadience Learning Online (ALO). This model emphasises a continuous cycle of assessment, analysis, instruction, and evaluation to refine instructional practices (Kaminski et al., 2018). Key features of the model include:

Outcomes Driven Model Steps:

- Identify need for support.
- Validate need for support.
- Plan and implement support.
- Evaluate and modify support.
- Review outcomes.



**Figure 2.1 Outcomes Driven Model**

Unlike traditional static instructional models, Outcomes Driven Model is designed to facilitate ongoing improvement, in which data collected during instruction not only informs the teaching strategies employed but also serves as a feedback mechanism for monitoring student progress (Acadience Learning, 2020; Good & Kaminski, 1996 ).

By integrating a dynamic approach to instructional refinement, Outcomes Driven Model ensures that literacy programs remain flexible and responsive to learners' changing needs. This adaptability is crucial, as it enables educators to adjust their instructional techniques in response to real-time data and student performance (Kaminski et al., 2018). In this way, the model not only addresses immediate instructional needs but also fosters long-term student growth by creating an environment that supports continuous improvement.

The Outcomes-Driven Model provides a theoretical and practical foundation for effective literacy interventions, promoting a systematic approach that prioritises data-driven decision-making and instructional adaptability. Consequently, this model plays

a pivotal role in enhancing literacy outcomes for diverse learners, aligning with the broader educational goals of fostering literacy proficiency and academic success (Acadience Learning, 2020; Good & Kaminski, 1996). The principles of ODM are aligned with best practices in reading intervention, including early identification, frequent progress monitoring, and instructional responsiveness (Stecker et al., 2008).

Globally, digital progress-monitoring systems have been shown to strengthen instructional decision-making by providing real-time, accurate data. Stecker et al. (2008), in a review of progress-monitoring interventions in the United States, found that frequent monitoring using digital or curriculum-based measures led to stronger reading gains for struggling learners. Their synthesis, drawing from experimental and quasi-experimental interventions, demonstrated that digital systems make progress data more accessible and actionable for teachers. Kaminski et al. (2018) provided technical validation of Acadience measures, confirming the reliability and predictive validity of oral reading fluency and decoding assessments across large datasets. Their psychometric analyses form the basis for the digital ALO platform.

African studies have increasingly explored the use of digital tools. Piper et al. (2018) utilised tablets for formative assessment within a literacy intervention in Kenya, demonstrating that digital progress data improved instructional responsiveness and decision-making regarding groupings. Moodley and Blease (2022) used a mixed-methods design in South Africa, combining quantitative assessment data with teacher interviews. Their study found that digital platforms enhanced decoding skills and facilitated personalised reading practice, though infrastructure challenges persisted. Cilliers et al. (2020) further demonstrated that digitally supported coaching improved

the quality of literacy instruction and learner outcomes, suggesting the broader value of technology-enabled monitoring.

In Ghana, however, digital progress monitoring remains limited. While some pilot schools under the Ghana Accountability for Learning Outcomes Project (GALOP) have received tablets for assessment, national studies, such as those by USAID (2023), confirm that most public schools still rely on infrequent paper-based assessments. Existing research in Ghana has largely centred on findings from the Early Grade Reading Assessment, a nationally administered, large-scale diagnostic tool designed to measure foundational reading skills such as letter recognition, decoding, oral reading fluency, and basic comprehension among lower primary learners. While EGRA provides valuable national and regional benchmark data on literacy performance, it is primarily used for system-level evaluation and policy reporting rather than for continuous, classroom-based instructional decision-making. Consequently, it does not typically function as a real-time progress monitoring tool for teachers.

### **Synthesis and Implications for the Present Study**

The literature across the sub-strands demonstrates that digital assessment, continuous progress monitoring, and data-driven instruction are mutually reinforcing elements that significantly shape reading achievement. Collectively, these systems:

1. enable earlier detection of reading difficulties,
2. provide real-time data for instructional decision-making,
3. support the personalisation of reading interventions,
4. offer actionable insights for tiered intervention under MTSS/RTI, and
5. strengthen routine instructional cycles such as GRR and T2E.

Despite robust global and regional evidence, the Ghanaian context continues to lack school-level systems that support frequent literacy monitoring and data-informed instructional adaptation (Ampiah et al., 2018; USAID, 2021). The absence of real-time monitoring tools means that many teachers cannot track learner growth or intervene early enough to prevent reading failure.

By integrating ALO into the instructional routines of Nii Sowah Din School, the present study addressed this gap by demonstrating how digital progress monitoring can enrich the T2E pedagogy, enable targeted intervention, and provide a sustainable model for improving decoding, fluency, and comprehension outcomes for Basic Three learners.

#### **Gap and relevance for the present study:**

There is an apparent absence of empirical research on continuous digital reading assessment integrated within daily instruction in Ghanaian basic schools. This study filled the gap by implementing ALO, analysed the data it generated, examined teacher uptake, and documented effects on decoding, fluency, and comprehension.

#### **2.4 Early-Grade Literacy Outcomes**

Early-grade literacy outcomes represent the foundational reading abilities that children acquire in the first years of schooling. These outcomes, most notably decoding, fluency, vocabulary, and comprehension, serve as the building blocks for more advanced literacy and overall academic achievement. Scholars widely acknowledge that early deficits in these areas often persist and intensify across grades, contributing to long-term learning challenges (Fuchs & Fuchs, 2006; Snow, 2018). In multilingual and low-resource contexts such as Ghana, early-grade literacy development becomes even more critical due to limited print exposure, inconsistent

instructional practices, and inadequate formative assessment systems. The present study is anchored in this landscape, examining how Acadience Learning Online (ALO) can strengthen early-grade literacy outcomes by providing continuous, data-driven insights to support targeted interventions within the Transition to English (T2E) instructional framework.

#### **2.4.1 Decoding Outcomes**

Decoding is the learner's ability to translate written symbols into spoken language, and it is consistently identified as the most powerful predictor of early reading success (Ehri, 2005; Gough & Tunmer, 1986). Decoding outcomes rest on three core subskills: phonemic awareness, graphophonemic knowledge, and word-reading accuracy.

Phonemic awareness, the ability to hear and manipulate phonemes, is foundational for understanding the alphabetic principle. Without it, learners struggle to blend, segment, and manipulate sounds, resulting in slow, error-prone reading (Ehri, 2005). Graphophonemic knowledge, in turn, concerns the learner's ability to connect sounds to letters and letter patterns. In multilingual African contexts, inconsistent exposure to English orthography often leads to weaker graphophonemic skills because learners have limited opportunities to encounter English print outside of school (Trudell, 2019). Word-reading accuracy, the proportion of words read correctly, is also critical. Low accuracy in the early grades has long been associated with persistent reading difficulties (Fuchs & Fuchs, 2006).

Empirical studies across Sub-Saharan Africa report widespread decoding challenges. RTI International (2018) found that many Primary Two and Three learners in Kenya, Tanzania, and Malawi could not decode simple consonant-vowel-consonant (CVC)

words. Similarly, Ghana's EGRA results show that a significant proportion of learners in Basic Two and Three lack foundational decoding skills (USAID, 2021).

ALO's decoding and accuracy indicators directly measure these core variables. By identifying learners who struggle with phonemic awareness and grapheme-phoneme correspondence early in the instructional cycle, ALO supports the present study's objective of using digital monitoring to tailor targeted phonics instruction for Basic Three learners.

#### **2.4.2 Fluency Outcomes**

Reading fluency, defined as the ability to read text with speed, accuracy, and proper expression, serves as a bridge between decoding and comprehension (Rasinski, 2012). When learners read fluently, cognitive resources are freed for meaning-making; when fluency is weak, comprehension suffers due to cognitive overload (Perfetti, 1999). Fluency outcomes typically incorporate three key variables: words correct per minute (WCPM), prosody, and automaticity.

Words Correct Per Minute (WCPM) is one of the strongest predictors of comprehension, with extensive research showing its correlation with later reading success (Fuchs et al., 2001). Prosody, the rhythm and expression with which learners read, signals deeper comprehension processes; learners with poor prosody often engage in robotic, word-by-word reading that limits meaning-making. Automaticity, the effortless recognition of familiar words, is equally essential because it enables learners to allocate more attention to higher-order comprehension tasks (LaBerge & Samuels, 1974).

In Africa, fluency deficits are particularly pronounced. Piper et al. (2018) reported that without explicit fluency practice, including repeated reading and guided oral reading, learners in Kenyan primary schools showed minimal improvements in oral reading fluency despite phonics instruction. Ghana's national studies also reveal stagnation in fluency rates among Basic Three pupils (USAID, 2021).

ALO's Oral Reading Fluency scores, which capture WCPM and accuracy, therefore provide essential metrics for monitoring fluency development and adjusting instructional pacing accordingly, directly supporting the goals of this study.

### **2.4.3 Vocabulary Outcomes**

Vocabulary knowledge plays a central role in both decoding and comprehension. It encompasses vocabulary breadth (number of words known), vocabulary depth (richness and nuance of word meanings), and oral language proficiency (knowledge gained through listening and speaking). Vocabulary is essential in multilingual contexts because learners may enter school with limited exposure to English vocabulary (Snow, 2018).

Research in African literacy contexts highlights vocabulary as a significant barrier to comprehension. Trudell (2019) notes that linguistic distance between learners' home languages and English limits natural vocabulary acquisition, while USAID (2021) found that Ghanaian learners exhibited limited English oral vocabulary due to minimal home exposure. Without adequate vocabulary instruction, learners struggle to attach meaning to decoded words, undermining comprehension even when decoding skills are present.

Although ALO does not directly assess vocabulary breadth, its retell and Maze tasks indirectly capture learners' ability to draw on vocabulary knowledge to construct meaning. These indicators are crucial for determining whether learners require additional vocabulary and oral language instruction, which is an essential component of the personalised interventions examined in this study.

#### **2.4.4 Reading Comprehension Outcomes**

Reading comprehension is the ultimate goal of literacy instruction and refers to the ability to extract and construct meaning from written text. Comprehension outcomes involve three dimensions: literal comprehension, inferential comprehension, and text integration and reasoning (Duke & Pearson, 2020).

Literal comprehension involves recalling explicitly stated information, while inferential comprehension requires the reader to go beyond the text to draw conclusions or make predictions. Text integration and reasoning represent the most advanced level of comprehension, requiring synthesis, evaluation, and interpretation.

Empirical studies across Africa consistently show widespread comprehension deficits. RTI International (2018) reported that the majority of learners assessed in East African countries could not answer basic comprehension questions despite being able to decode words. Piper et al. (2018) similarly found that many learners with improved decoding still struggled with inferential comprehension due to limited exposure to oral English and weak instruction in comprehension strategies. In Ghana, fewer than 15% of Basic Three learners meet comprehension benchmarks (USAID, 2021).

ALO's Maze comprehension and retell tasks provide valid indicators of comprehension development, enabling teachers to detect comprehension gaps early and adjust instruction with targeted T2E and MTSS-aligned strategies.

Global evidence reinforces the foundational importance of decoding, fluency, vocabulary, and comprehension in early literacy development. For example, the National Reading Panel (2000) conducted a meta-analysis demonstrating that structured phonics instruction significantly improves decoding, while Fuchs and Fuchs (2006) found that early deficits in decoding and fluency often persist in the absence of systematic assessment and intervention.

In Sub-Saharan Africa, repeated Early Grade Reading Assessments (EGRAs) indicate severe early-grade literacy deficits. RTI International (2018) documented that many learners across Kenya, Uganda, Tanzania, and Malawi read below grade level due to inadequate exposure to structured phonics, limited reading practice, and insufficient formative assessment. Piper et al. (2018) further demonstrated that literacy interventions combining explicit instruction with regular assessment significantly improved fluency and comprehension.

In Ghana, empirical findings point to similar patterns. USAID (2021) reported that decoding and fluency remain significant challenges among Basic Two and Three learners, while Ampiah et al. (2018) found that reading instruction remains largely teacher-centred, with few opportunities for guided practice or differentiated instruction. These findings underscore the need for continuous, data-driven progress monitoring tools such as ALO, which Ghanaian classrooms currently lack.

#### **2.4.6 Implications for the Present Study**

The conceptual and empirical evidence across decoding, fluency, vocabulary, and comprehension highlights the urgency of addressing early-grade literacy challenges using structured, data-driven systems. In Ghana's multilingual classrooms, where learner performance varies widely and formative assessment is inconsistent, digital monitoring tools like ALO offer a practical means to diagnose learning needs, track growth, and guide personalised interventions.

ALO's ORF, accuracy, retell, and Maze tasks directly measure the core literacy components outlined above, enabling teachers to deliver targeted instruction aligned with the Transition to English (T2E) programme. This directly supports the study's objectives: improving literacy outcomes through real-time progress monitoring and personalised intervention. The study also investigates teacher and learner experiences with ALO, addressing a significant gap in Ghana's early-grade literacy research: digital progress monitoring has rarely been implemented or evaluated.

#### **Gap and relevance for the present study:**

Despite extensive global and regional research, Ghana continues to lack sustained, school-level systems for continuous literacy monitoring and targeted intervention. Existing national evaluations highlight the literacy crisis, but do not provide a mechanism for ongoing tracking of learner progress. This study addressed this gap by implementing ALO as a continuous monitoring tool within an instructional programme (T2E), thereby contributing practical evidence on improving early-grade literacy through data-driven instruction in a non-GALOP Ghanaian public school.

## **2.5 Bilingual Literacy and Transition to English (T2E) Programme Effectiveness**

Bilingual literacy development in Ghana's early-grade classrooms is influenced by a complex interplay of linguistic, instructional, environmental, and technological factors. The Transition to English (T2E) programme aims to strengthen learners' literacy outcomes by gradually shifting instruction from Ghanaian languages to English while supporting learners with phonics, vocabulary, decoding, and comprehension strategies. However, the success of this transition depends on multiple variables, including language of instruction, instructional quality, transition timing, availability of learning resources, and the integration of digital tools such as ALO. The following subsections examine these variables in detail.

### **2.5.1 Language of Instruction and Linguistic Transfer**

The language of instruction plays a decisive role in early-grade literacy outcomes, particularly in multilingual environments such as Ghana. One critical variable is linguistic distance, which refers to how closely learners' home languages align with the structure and phonology of English. According to Cummins (2017), learners experience greater ease in transferring phonological awareness and decoding skills when the linguistic distance between languages is small. In many Ghanaian settings, however, learners encounter significant linguistic distance, limiting their ability to map familiar sound structures onto English orthography. Trudell (2019) found that such linguistic mismatches significantly delay English reading development, especially among children whose home languages differ markedly from English in both phonology and orthography.

A second variable under this strand is the transferability of phonological and decoding skills. Cummins' (2017) interdependence hypothesis suggests that strong foundational

skills acquired in a familiar language, such as phonemic awareness, blending, segmentation, and word recognition, can transfer to English reading. Piper et al. (2018) demonstrated that learners who received structured mother-tongue literacy instruction in the early grades showed faster gains in English decoding after the transition. This transfer, however, requires a strong literacy foundation in the first language, something not consistently available in many Ghanaian classrooms due to resource constraints and inconsistent policy implementation.

Another variable is bilingual proficiency and home-language exposure, which influence learners' conceptual understanding and oral vocabulary development. Learners with strong oral proficiency in their home languages tend to develop better English vocabulary and comprehension because conceptual knowledge transfers across languages (RTI International, 2018). However, when children enter school with weak proficiency in their mother tongue, both their Ghanaian language literacy and English reading outcomes are affected.

Finally, English oral language exposure is a crucial variable. Limited exposure to English at home constrains learners' vocabulary acquisition, inferential comprehension ability, and general familiarity with academic English (Snow, 2018). USAID (2021) noted that Ghanaian Basic Two and Three learners with minimal English exposure performed significantly lower on EGRA oral comprehension tasks.

In all these areas, ALO provides diagnostic information that enables teachers to distinguish whether reading difficulties stem from linguistic transfer challenges or from weaknesses in decoding, fluency, or comprehension, thereby supporting more targeted T2E instruction.

### **2.5.2 Instructional Quality in Bilingual and T2E Programmes**

Instructional quality remains a key determinant of bilingual literacy development. A central variable is teachers' proficiency in both English and local languages, as they must effectively model pronunciation, guide vocabulary development, and facilitate phonics instruction. Goldenberg (2011) argues that teacher linguistic competence is essential for maintaining instructional clarity and supporting learners' conceptual development. However, Owu-Ewie and Edu-Buandoh (2014) highlight that many Ghanaian teachers struggle with English proficiency, which limits the effectiveness of T2E delivery.

A second variable is phonics and reading pedagogy fidelity, which refers to the extent to which teachers implement structured phonics routines as prescribed in T2E. The National Reading Panel (2000) emphasises that high-quality phonics instruction requires consistency, adequate practice, and explicit modelling. However, USAID (2021) reports variability in how Ghanaian teachers apply these routines, with many classrooms focusing more on whole-word recognition or rote copying rather than systematic phonics.

Another important variable relates to scaffolding and guided practice. Effective literacy instruction in bilingual settings requires modelling, guided reading, corrective feedback, and gradual release of responsibility. Goldenberg (2011) found that comprehension and fluency improve significantly when teachers use structured scaffolding. In contrast, Cilliers et al. (2020) observed that weak scaffolding in South African bilingual classrooms contributed to low fluency and comprehension scores.

Opportunities for oral language development represent an additional instructional variable. Oral language activities, including retell, picture description, vocabulary

practice, and group discussions, support comprehension by strengthening listening and expressive skills (Snow, 2018). RTI International (2018) found that classrooms with stronger oral language routines recorded higher comprehension outcomes in East African literacy projects.

ALO supports instructional quality by providing teachers with real-time data on decoding, fluency, accuracy, and comprehension, enabling them to determine whether instructional weaknesses rather than learner deficits are contributing to poor performance.

### **2.5.3 Transition Timing and Implementation Fidelity**

The success of bilingual literacy programmes depends heavily on when and how the transition from a local language to English occurs. The first variable under this sub-strand is transition timing, which concerns when English becomes the primary medium of instruction. Heugh (2011) argues that premature transition to English disrupts conceptual development, leading to shallow comprehension even among learners who can decode text. Benson (2004) found that early transition in Mozambique resulted in low comprehension outcomes because learners had not sufficiently developed mother-tongue literacy.

A second variable is teacher adherence to T2E policy, which determines how consistently teachers follow prescribed transition guidelines. Owu-Ewie and Edu-Buandoh (2014) documented wide variation in how Ghanaian teachers implement language-of-instruction policy, with some transitioning earlier than recommended due to parental or administrative pressure. USAID (2021) confirms similar inconsistencies in transition practices across Ghanaian districts.

The third variable is learner readiness for English transition, which depends on whether learners have acquired sufficient mother-tongue decoding, vocabulary, and comprehension skills. Piper et al. (2018) found that learners who had not solidified these foundational skills before transition performed poorly in English reading tasks, even when adequate instruction was provided later.

A fourth variable concerns school-level policy enforcement and support, including administrative monitoring, availability of teacher guides, and frequency of supervision. RTI International (2018) observed that schools with strong instructional leadership achieved significantly higher literacy outcomes than those with weak oversight.

Here again, ALO offers an evidence-based mechanism for determining learner readiness during transition and monitoring the fidelity of English reading instruction during the post-transition period.

#### **2.5.4 Learning Resources, Classroom Conditions, and Exposure**

The availability of learning resources and the quality of classroom conditions are critical to bilingual and T2E literacy outcomes. One key variable is the availability of instructional materials, such as decodable readers, vocabulary charts, storybooks, and teacher guides. Pretorius and Spaul (2016) showed that repeated reading of decodable texts significantly improves fluency and accuracy. However, Ghanaian classrooms often lack sufficient materials, reducing opportunities for independent reading practice (USAID, 2021).

A second variable is the print-rich classroom environment, which includes reading corners, labelled objects, charts, and visual literacy aids. Snow (2018) notes that print-

rich settings expose learners to the orthographic and morphological structure of English, contributing to vocabulary acquisition and reading fluency. Cilliers et al. (2020) found that print-rich classrooms in South Africa performed better on comprehension assessments.

A third variable is class size and instructional load. Large class sizes reduce teacher–learner interaction, limit guided reading opportunities, and constrain the personalised feedback necessary for bilingual literacy development. In Ghana, classes often exceed 45 learners, leading to surface-level reading practice (USAID, 2021).

The fourth variable concerns home literacy exposure. RTI International (2018) documented that learners in low-literacy homes acquire vocabulary at slower rates, affecting decoding, fluency, and comprehension.

ALO does not replace these resources but helps teachers prioritise learners who require increased reading practice, vocabulary support, or additional comprehension scaffolding.

#### **2.5.5 Effectiveness of Digital-Supported T2E Interventions**

Digital tools increasingly play a role in supporting bilingual transitions and strengthening T2E implementation. One significant variable is the accuracy and reliability of digital assessments. Kaminski et al. (2018) demonstrated that digital CBM tools reliably measure decoding and fluency, offering a strong evidence base for their use in early-grade classrooms.

Another variable is teacher use of digital feedback, which refers to teachers' ability to interpret ALO data and adjust instruction accordingly. Hamilton et al. (2009) found

that classrooms where teachers actively engaged with digital data implemented more effective interventions.

A third variable is the integration of digital tools with phonics and T2E routines. Piper et al. (2018) observed that when digital monitoring was combined with structured phonics instruction in Kenyan classrooms, fluency and comprehension outcomes improved significantly.

The final variable is immediacy and frequency of feedback. Fuchs and Fuchs (2006) emphasise that frequent progress monitoring strengthens intervention effectiveness. Stecker et al. (2008) found that digital monitoring enhanced instructional responsiveness and reduced the time required to identify learners at risk.

ALO aligns with these findings by providing immediate feedback on decoding, fluency, and comprehension, enabling timely T2E intervention.

### **2.5.6 Implications for the Present Study**

The variables discussed across the strands: linguistic distance, instructional quality, transition fidelity, availability of resources, and digital-supported interventions collectively influence early-grade literacy outcomes in Ghana. The present study builds on this evidence by integrating ALO into the T2E instructional framework at Nii Sowah Din Basic School. In line with Objective 1, ALO supports real-time progress monitoring; aligned with Objective 2, it enables personalised phonics, fluency, and comprehension interventions; and consistent with Objective 3, it helps identify teacher and learner experiences that influence the fidelity and effectiveness of digital-supported literacy interventions.

### **Gap and relevance for the present study**

Although T2E is the national framework for bilingual transition, its effectiveness is constrained by the lack of real-time literacy data to guide instruction. No Ghanaian study has integrated a digital assessment tool such as ALO into the T2E programme to strengthen the transition process. This study addressed this empirical gap by examining how ALO-generated data can support decoding, fluency, and comprehension within T2E.

## **2.6 Multi-Tiered Systems of Support (MTSS) and Response to Intervention (RTI) in Early-Grade Literacy**

The Multi-Tiered Systems of Support (MTSS) and Response to Intervention (RTI) frameworks constitute an evidence-based organisational structure that strengthens early-grade literacy, especially in multilingual and resource-constrained contexts such as Ghana. Both frameworks emphasise early universal screening, tiered instructional supports, frequent progress monitoring, and data-driven decision-making, ensuring that learners receive instruction tailored to their level of need. In settings where large class sizes, limited reading materials, and inconsistent instructional supervision hinder literacy development, MTSS/RTI approaches offer a systematic mechanism for identifying struggling readers early and providing timely intervention. The integration of a digital tool such as Acadience Learning Online (ALO) enhances the operational efficiency of these frameworks by automating assessment, benchmarking, and progress-tracking processes.

### **2.6.1 Early Screening and Universal Assessment**

Early screening and universal assessment form the foundation of MTSS and RTI implementation because they enable schools to detect reading difficulties before they

escalate. Screening is conducted for all learners, typically at the beginning, middle, and end of the school year, to identify those at risk of reading failure.

#### **a) Screening Tools**

Effective screening relies on brief, reliable, and sensitive instruments capable of detecting early reading challenges. According to Fuchs and Fuchs (2006), measures such as oral reading fluency (ORF) and nonsense word fluency are among the most predictive indicators of foundational reading development. These tools require minimal administration time yet yield strong diagnostic insights into phonemic awareness, decoding, and accuracy. Digital tools like ALO further strengthen screening by providing standardised administration, error-free automated scoring, and immediate results (Kaminski et al., 2018). These features are particularly beneficial in Ghanaian classrooms where teachers manage large pupil populations and often have limited assessment training.

#### **b) Benchmarking and Risk Classification**

Another core variable under early screening is the use of benchmarks and risk categories to classify learners' performance levels. MTSS/RTI frameworks typically categorise learners as "at risk," "some risk," or "low risk", based on grade-level literacy benchmarks (McIntosh & Goodman, 2016). These benchmarks determine the level of instructional support a learner requires and guide placement into Tier 2 or Tier 3 interventions. ALO simplifies this classification by automatically assigning risk levels and visually representing learner performance relative to expected norms. This allows teachers at Nii Sowah Din Basic School to make consistent, objective decisions about intervention needs.

### **2.6.2 Tiered Instructional Supports**

Tiered instruction is the operational heart of MTSS/RTI. Each tier provides increasing levels of instructional intensity according to learner need.

### **Tier 1: Universal Instruction**

Tier 1 represents general classroom instruction for all learners. Effective Tier 1 literacy instruction includes explicit phonics, oral language development, vocabulary instruction, guided reading, and structured comprehension strategies. However, evidence from Ghana indicates significant weaknesses at this level. National assessments show that only 6% of lower primary, 29% of upper primary, and 59% of JHS learners meet minimum Grade 2 literacy standards (World Education Blog, 2024), mainly due to inconsistent instructional quality and inadequate materials (Ampiah et al., 2018).

ALO enhances Tier 1 delivery by enabling teachers to monitor learners' reading fluency, decoding, and comprehension performance in real time. This supports early identification of learners not responding to universal instruction (Fuchs & Fuchs, 2006).

### **Tier 2: Targeted Small-Group Intervention**

Tier 2 provides targeted, small-group instruction for learners who show partial mastery of Tier 1 skills. These interventions are structured, sustained, and focused on specific reading deficits such as decoding, fluency, or comprehension. Research from Kenya and South Africa shows that small-group targeted interventions significantly improve learner performance when delivered consistently (Piper et al., 2018; Moodley & Blease, 2022).

ALO supports Tier 2 implementation by offering frequent performance snapshots that reveal whether learners are responding to targeted instruction. When progress stalls, teachers can promptly adjust instructional strategies, thereby improving intervention effectiveness (Hamilton et al., 2009).

### **Tier 3: Intensive Individualised Support**

Tier 3 is reserved for learners with persistent reading difficulties who show minimal or no progress under Tier 2 instruction. Instruction at this level requires highly individualised phonics remediation, scaffolded fluency development, and close monitoring of comprehension processes (RTI International, 2018).

In Ghana, where overcrowded classrooms and limited personnel make Tier 3 challenging, ALO becomes an essential tool for determining which learners require the highest level of support and for tracking progress precisely.

### **2.6.3 Progress Monitoring and Instructional Adjustment**

Progress monitoring is a core operational feature of MTSS/RTI and involves frequent, systematic assessment weekly or biweekly of targeted reading skills to evaluate learner growth and instructional effectiveness (Stecker et al., 2008).

#### **a) Data Points and Growth Curves**

The first variable under progress monitoring concerns the number and consistency of data points collected. Research indicates that at least six consecutive data points are required to identify accurate growth trends and make reliable instructional decisions (Fuchs & Fuchs, 2006). ALO is particularly effective in this regard because it automatically generates growth curves that enable teachers to visualise learner trajectories in decoding, fluency, and comprehension. These visual trends help

determine whether learners are responding adequately to intervention or require intensified support.

#### **b) Decision Rules and Cut Scores**

A second variable involves the use of decision rules and cut scores to guide instructional adjustments. McIntosh and Goodman (2016) argue that clear criteria are essential for determining when instruction should change, continue, or escalate. For example, if a learner demonstrates no measurable improvement after four weeks of Tier 2 intervention, teachers should either modify the intervention or escalate the learner to Tier 3. ALO facilitates this process by comparing learner performance to grade-level benchmarks and providing risk indicators that support timely instructional decisions.

Progress monitoring through ALO, therefore, ensures that instruction is responsive, data-driven, and tailored to learners' needs, aligning directly with the present study's objective of improving reading outcomes through real-time digital monitoring.

#### **2.6.4 Implementation Challenges in Low-Resource Schools**

The implementation of MTSS/RTI frameworks in low-resource contexts such as Ghana is shaped by multiple systemic, pedagogical, and infrastructural barriers that hinder the smooth delivery of tiered literacy interventions. Although MTSS/RTI models provide a structured framework for identifying and supporting struggling readers, their success is dependent on contextual enablers such as teacher capacity, instructional resources, manageable class sizes, and technology factors that are often inadequate in many public basic schools. As a result, applying MTSS/RTI with fidelity remains a significant challenge despite its proven effectiveness.

### **a) Limited Teacher Training**

A significant variable influencing MTSS/RTI effectiveness is the limited level of teacher preparedness. Educators frequently lack sufficient training in MTSS processes, particularly in screening procedures, progress monitoring, data interpretation, and decision-making rules (Cilliers et al., 2020). Many teachers are unfamiliar with how to administer universal screeners, analyse fluency and decoding results, or use benchmark data to differentiate instruction. This lack of foundational knowledge leads to inconsistent implementation of Tier 1 instruction and weak follow-through into Tier 2 and Tier 3 interventions. In Ghana, where pre-service and in-service training often prioritise theoretical coursework over diagnostic literacy practice, teachers are less confident in applying specialised intervention frameworks such as MTSS/RTI. Consequently, learners who require early interventions are often overlooked or misidentified due to inaccurate interpretation of assessment data.

### **b) Inadequate Materials and Technology**

A second variable that significantly constrains MTSS/RTI implementation is the scarcity of high-quality instructional materials and digital infrastructure. Effective tiered interventions require access to decodable texts, levelled readers, assessment tools, and technology platforms that support screening and progress monitoring (Ampiah et al., 2018). However, many Ghanaian basic schools lack even the most essential reading materials, and available books are often mismatched to learners' reading levels. The absence of digital devices such as tablets or laptops further limits the use of evidence-based digital tools like ALO, which could otherwise automate assessment scoring, track learner performance, and simplify data-driven decisions. Without these resources, teachers rely heavily on manual assessments, which are time-consuming, error-prone, and difficult to manage in large classrooms. These

constraints weaken the reliability and frequency of progress monitoring, a key requirement of MTSS and RTI.

### **c) Class Size Constraints**

A third critical variable is the prevalence of large class sizes, which makes differentiated and small-group instruction challenging. MTSS/RTI models depend on teachers' ability to provide targeted Tier 2 instruction and intensive Tier 3 support to small groups or individual learners. However, in many Ghanaian public schools, class sizes commonly exceed 45 pupils per teacher, severely limiting opportunities for one-on-one reading practice, immediate feedback, or structured small-group intervention (USAID, 2021). Large class sizes also reduce the feasibility of frequent progress monitoring, as teachers struggle to administer assessments to all learners in a timely and consistent manner.

These constraints collectively weaken the fidelity of MTSS/RTI implementation, resulting in delays in identifying struggling readers, inconsistent delivery of interventions, and reduced instructional responsiveness. Digital progress-monitoring systems such as ALO offer partial mitigation by reducing teacher workload, automating scoring, and providing instant feedback; however, without complementary improvements in teacher training, classroom resources, and class-size management, the full potential of MTSS/RTI cannot be realised.

Globally, substantial research supports MTSS and RTI as powerful mechanisms for improving reading outcomes. Fuchs and Fuchs (2006), in a foundational review, demonstrated that RTI significantly reduces the number of learners requiring special education placement by identifying reading difficulties early and delivering targeted support. Their evidence-based model, grounded in repeated curriculum-based

measurements (CBM), has shaped global practice. Similarly, Al Otaiba et al. (2014), using quasi-experimental designs in US elementary schools, found that learners receiving tiered supports guided by continuous progress monitoring showed superior gains in decoding and oral reading fluency compared to peers in traditional classrooms. These studies underscore that MTSS/RTI frameworks are effective because they integrate assessment, differentiation, and systematic intervention cycles.

More recently, integrated MTSS systems have been enhanced by technological tools that automate data tracking and streamline teacher decision-making. Johnson et al. (2020) highlighted that digital MTSS platforms improve fidelity of implementation because teachers can quickly identify learners who need Tier 2 or Tier 3 intervention. As a result, MTSS has evolved into a data-intensive model in high-income contexts, where digital recording systems are increasingly replacing manual CBMs. This shift demonstrates the growing global trend of pairing digital progress monitoring with tiered literacy supports.

Within Sub-Saharan Africa, MTSS and RTI are not widely implemented as formal frameworks, yet several documented literacy interventions exhibit tier-like features, even if not labelled as such. In South Africa, Sailors et al. (2014) found, through a quasi-experimental study, that small-group reading interventions designed for at-risk learners improved decoding accuracy and oral reading fluency. However, the intervention did not explicitly adopt the MTSS label; its structure was a universal instruction supported by targeted pull-out groups aligned closely with Tier 2 design parameters.

Kenya provides further evidence: Piper et al. (2018) implemented an extensive cluster-randomised literacy intervention that used differentiated instruction supported

by frequent assessment. Their findings revealed significant improvements in fluency and comprehension for learners identified as struggling readers. The intervention functioned similarly to MTSS by identifying learners through regular assessment and providing structured, intensified instruction. Moreover, Cilliers et al. (2020) demonstrated that teacher coaching supported by digital progress data improved instructional quality and helped teachers group learners more effectively, another key MTSS practice.

Despite these emerging examples, most African education systems lack the systemic structures necessary for formal MTSS implementation. Interventions tend to be short-term, donor-funded, or pilot-based, limiting long-term impact and scalability (RTI International, 2018). Nonetheless, the principles of MTSS data-driven grouping, intensification of support, and early identification are increasingly present in regional literacy programmes.

In Ghana, MTSS or RTI is rarely implemented as a formalised, school-wide system. Instructional practices remain largely whole-class and teacher-centred (Ampiah et al., 2018). National curriculum documents encourage differentiation, but teachers often lack the resources, time, or assessment tools needed to enact it. As a result, Ghanaian classrooms commonly exhibit highly mixed reading abilities, with significant numbers of learners who are far below grade level receiving the same instruction as their peers.

Empirical data from USAID's EGRA studies (2021; 2023) reveal that Tier 1 instruction is not meeting the needs of the majority of learners, with fewer than 20% of Basic Three pupils reading fluently. The lack of systematic progress monitoring means teachers cannot identify learners who need Tier 2 or Tier 3 supports. USAID

(2019) further reports that teachers have limited exposure to structured small-group literacy instruction or intensive intervention strategies, and schools lack digital tools that could improve the frequency and reliability of assessment. In instances where intervention efforts have occurred, such as the National Reading Radio Programme and T2E routines, they do not incorporate ongoing diagnostic assessment or tiered support structures. Thus, while Ghana exhibits significant literacy gaps, there is also a lack of a national strategy for MTSS-aligned implementation, leaving a vacuum for evidence-based data-driven approaches.

Three significant empirical gaps persist in the Ghanaian and broader Sub-Saharan African context:

1. Absence of studies that integrate digital progress monitoring with tiered literacy intervention approaches in the Ghanaian context. While ALO, DIBELS, and Tangerine have shown promise in assessment in other jurisdictions, such as the US, research has not yet examined how these tools can guide tiered instruction in low-resource classrooms within the Ghanaian context.
2. Limited evidence on how teachers interpret and act upon digital data to provide differentiated literacy support. Studies indicate that teachers struggle to use data effectively (Jimerson, 2016; USAID, 2019), yet no Ghanaian research has explored teacher decision-making within an MTSS-aligned digital ecosystem.
3. Lack of implementation research in non-GALOP, high-need public schools.

Many existing programmes in Ghana are limited to GALOP-funded schools, leaving significant knowledge gaps about how MTSS/RTI can function in typical under-resourced environments.

These gaps underscore the need for school-based, data-driven literacy interventions that integrate MTSS principles with real-time digital progress monitoring.

## **2.7 Teacher Use of Assessment Data**

Teacher use of assessment data refers to the systematic processes through which educators review, interpret, and apply assessment information to guide instructional planning and delivery. In early-grade literacy, where timely instructional adjustments can prevent long-term reading challenges, data use is increasingly recognised as a key driver of improved learning outcomes (Hamilton et al., 2009; Mandinach & Gummer, 2016). Effective data use enables teachers to identify learners' specific strengths and weaknesses, tailor instruction accordingly, and monitor progress dynamically and responsively. However, in low-resource settings such as Ghana, integrating assessment data into teaching practice is often inconsistent due to limited training, inadequate tools, and overwhelming instructional demands. As a result, although assessment data has significant potential for shaping instructional improvement, its value can only be realised when it is meaningfully interpreted and incorporated into daily teaching practices; when data is collected but unused, it becomes redundant and loses instructional relevance.

### **2.7.1 Data Literacy and Interpretation Skills**

Data literacy forms the foundation for effective teacher use of assessment data, as it determines how well teachers understand and interpret the information generated through literacy assessments. Teachers must not only be able to read scores but also understand what they indicate about learners' reading development. This requires a solid understanding of the core literacy constructs such as phonemic awareness, decoding, fluency, vocabulary, and comprehension, which collectively support early

reading success (Snow, 2018). Without this foundational knowledge, teachers may misinterpret assessment outcomes or fail to detect early signs of reading difficulty.

In addition to conceptual literacy knowledge, teachers must be able to analyse assessment trends and recognise patterns or error types that reveal underlying learning issues. Hamilton et al. (2009) explain that teachers must interpret consistent miscues, flat or declining fluency trajectories, and low accuracy rates to diagnose whether learners struggle with phonics, automaticity, or comprehension. When teachers possess strong interpretation skills, assessment data becomes a meaningful diagnostic tool, enabling them to make proactive instructional adjustments rather than reactive or generalised responses.

### **2.7.2 Instructional Adaptation Based on Assessment Data**

The central purpose of collecting and interpreting assessment data is to inform instructional decisions. Teachers who understand learners' performance profiles are better positioned to adjust lesson pacing, provide targeted support, and differentiate instruction to meet diverse learning needs. Differentiation is crucial, as data enables teachers to group learners by reading ability for more targeted phonics, fluency, or comprehension instruction. Piper et al. (2018) emphasise that grouping learners based on data helps teachers deliver more focused support and improves reading outcomes, particularly in early grades.

Furthermore, assessment data allows teachers to adjust the intensity and pacing of instruction. Learners who exhibit slow or minimal progress may need intensified phonics instruction, extended oral reading practice, or simplified texts that promote accuracy and confidence (Fuchs & Fuchs, 2006). Conversely, learners demonstrating substantial improvement may require accelerated pacing or increased reading

complexity. In addition, using assessment results to provide tailored feedback helps learners become active participants in their learning. As Hattie (2009) argues, specific, evidence-based feedback, such as showing learners their fluency graphs, enhances motivation, supports metacognitive awareness, and fosters ownership of learning progression.

### **2.7.3 Technology-Enhanced Data Use**

Digital tools such as Acadience Learning Online (ALO) have transformed how teachers interpret and use assessment data by simplifying and accelerating data processing. Digital platforms present information visually through graphs, accuracy percentages, growth trends, and benchmark colours, which substantially reduce teacher cognitive load and enable quicker and more accurate interpretation (Kaminski et al., 2018). These visual representations help teachers understand learner progress at a glance and identify emerging challenges before they escalate.

Moreover, automated scoring systems like ALO minimise the risks associated with manual assessment, which is often time-consuming and error-prone. Stecker et al. (2008) note that automated scoring enables teachers to make timely instructional decisions because results are generated immediately and consistently. This efficiency is critical in large classrooms, where manual scoring across multiple learners can delay intervention and weaken instructional responsiveness. Through automation and visualisation, digital tools significantly enhance teachers' capacity to engage with assessment data in meaningful and actionable ways.

### **2.7.4 Barriers to Effective Data Use in Low-Resource Contexts**

Despite the benefits of assessment data, several contextual constraints hinder effective data use in many low-resource settings. One prominent barrier is insufficient

professional development. Many teachers receive limited training in interpreting assessment data or translating data insights into instructional adjustments, which undermines their ability to use assessment results to guide decision-making (Cilliers et al., 2020). This training gap often results in superficial or inconsistent data use, even when assessments are conducted regularly.

Additionally, heavy workloads and large class sizes reduce the time teachers can devote to analysing assessment results and planning differentiated instruction. USAID (2021) reports that in some Ghanaian basic schools, pupil-teacher ratios exceed 45:1, making it difficult for teachers to conduct detailed error analysis or regroup learners regularly. This structural pressure limits their capacity to engage meaningfully with assessment data.

Another key barrier is limited access to digital tools. In schools without digital platforms such as ALO, teachers must rely on manual analysis, which is time-consuming, error-prone, and difficult to scale, especially in crowded classrooms (RTI International, 2018). Without digital support, the frequency and consistency of data use decrease, undermining the potential of assessment-driven instruction.

Globally, numerous studies have shown that teacher use of assessment data improves instructional quality. Hamilton et al. (2009), through mixed-method case studies across US districts, found that teachers who regularly analysed learner performance data implemented more effective reading instruction. Jimerson (2016) found similar results, reporting that teacher confidence in data interpretation correlated strongly with improved literacy outcomes.

Regionally, Cilliers et al. (2020) demonstrated that digital coaching and data-driven instructional cycles significantly improved learner reading scores in South Africa. The study used experimental designs and teacher interviews to examine how teachers used data to differentiate instruction.

In Ghana, however, research shows that teachers seldom use assessment data systematically. Ampiah et al. (2018) reported that classroom assessment practices are largely summative, infrequent, and unconnected to instructional planning. USAID (2019) also found that early-grade teachers lacked confidence in using assessment data to group learners or adjust lessons. No Ghanaian study has examined how teachers interpret and act on digital literacy data, leaving a significant gap in the literature.

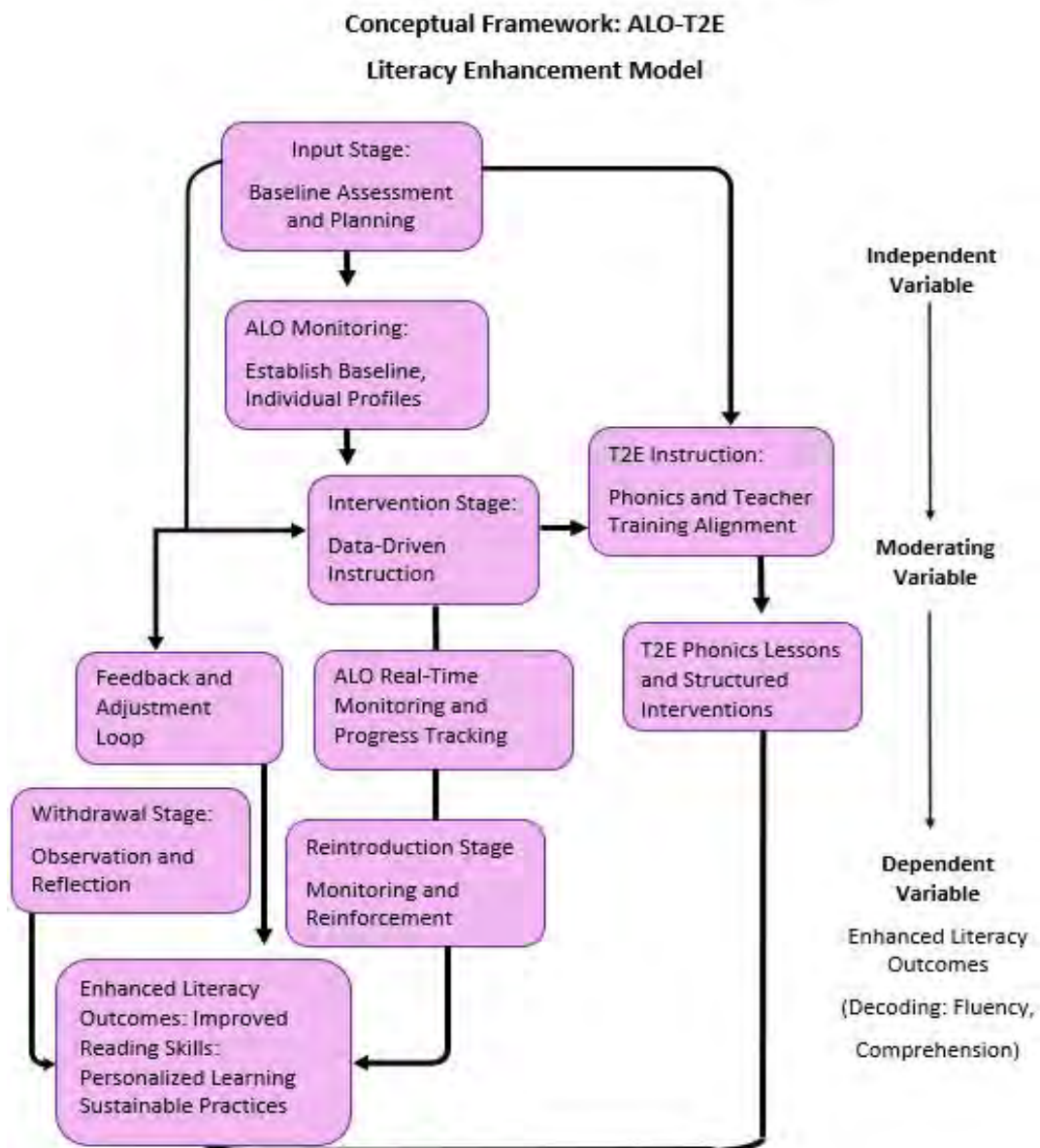
### **2.7.5 Relevance to the Present Study**

This study examines how teachers at Nii Sowah Din Basic School utilise ALO data, ORF scores, accuracy percentages, and retell indicators to adjust instruction within the T2E and MTSS frameworks. By focusing on teacher decision-making and instructional adaptation, the study addresses a significant gap in Ghana's literacy landscape: the underuse of assessment data for differentiated instruction. Findings will contribute to understanding how data-driven practices can be institutionalised in low-resource classrooms to strengthen early-grade literacy outcomes.

#### **Gap and relevance for the present study:**

Teacher data-use practices remain one of the weakest links in Ghana's literacy ecosystem. This study fills an empirical gap by exploring how teachers use ALO data to form groups, adjust instruction, and implement T2E routines within an MTSS-aligned framework.

## 2.8 Conceptual Framework



**Figure 2.2 Conceptual Framework**

**Source, generated by researcher to guide intervention, 2025**

This conceptual framework illustrates how digital assessment (ALO) drives data-informed instruction, while T2E and GRR moderate the pathway between assessment and outcome. ALO generates real-time diagnostic data to identify learner needs, while the T2E approach provides structured bilingual instruction, and GRR ensures gradual learner autonomy. The directional relationship (ALO → T2E/GRR → Literacy

Outcomes) indicates that the quality of instructional implementation mediates the effectiveness of digital monitoring. Ultimately, the model promotes adaptive, evidence-based teaching that leads to measurable improvements in decoding, fluency, and comprehension among Basic Three learners.

The ALO-T2E Literacy Enhancement Model draws on principles from the Outcome-Driven Model to address the specific literacy challenges faced by resource-limited schools, such as Nii Sowah Din. The model integrates the real-time progress monitoring capabilities of Acadience Learning Online (ALO) with the structured, phonics-based instruction of the Transition to English (T2E) Programme. Together, these components aim to ensure measurable and sustained improvements in decoding, reading fluency, and comprehension. This study integrates digital data monitoring through Acadience Learning Online (ALO) with structured literacy instruction under the Transition to English (T2E) and Gradual Release of Responsibility (GRR) models. The process unfolds in the following steps:

### **Step 1: Assessment and Grouping**

Teachers begin by administering the ALO screener to assess all Basic Three learners' literacy skills, including decoding, fluency, and comprehension. For example, in the classroom, teachers use ALO results to group learners, such as emergent readers who need phonics support and more fluent readers who require comprehension strategies, to tailor instruction effectively.

### **Step 2: Targeted Instruction**

Instruction is differentiated based on group needs. Learners who struggle with foundational skills participate in activities such as letter-sound matching and blending exercises, using counters and letter cards. Advanced groups engage in guided oral

reading and vocabulary enrichment tasks. For instance, a teacher might lead a small group through echo reading or vocabulary word sorting while another group practices phonics drills.

### **Step 3: Ongoing Progress Monitoring**

ALO assessments are conducted biweekly to track learner growth. The digital dashboard visualises each student's progress, allowing the teacher to adjust groupings or intervention intensity as needed. For example, a learner showing improvement might move from the foundational to the developing group, while others receive reinforced support.

### **Step 4: Feedback and Reflection**

Teachers incorporate real-time feedback during lessons, encouraging learners to self-assess and participate in peer reading sessions. Classroom examples include think-aloud strategies, partner retells, and the use of comprehension questions to promote metacognitive skills.

### **Step 5: Gradual Release to Independence**

As learners develop proficiency, teaching shifts from explicit instruction to independent reading tasks. For example, students read familiar texts independently or engage in Maze comprehension activities while the teacher monitors progress using ALO to ensure retention.

### **General Principles:**

**Data-Driven Decisions:** Instructional adjustments are continuously informed by real-time ALO data.

**Personalised Learning:** Groupings and activities are responsive to individual student needs.

**Scaffolded Support:** Instruction transitions gradually from teacher-led to learner-driven.

**Sustainability:** The cyclical assessment and feedback loop promotes ongoing reading development.

## **2.9 Conclusion and Summary**

The empirical review highlights significant findings across multiple strands pertinent to early-grade literacy and educational interventions, while also outlining critical gaps within the current landscape.

Globally, early-grade literacy is recognised as essential for long-term academic success, but persistent challenges such as decoding, fluency, and comprehension remain widespread. Research by Fuchs and Fuchs (2006) and the National Reading Panel (2000) underscores the necessity of systematic assessments and structured phonics instruction. In Sub-Saharan Africa, studies indicate alarming literacy deficits, particularly evident in assessments by RTI International (2018) and Piper et al. (2018), which reveal that many young learners are unable to read at grade level. In Ghana, the situation is comparably dire, with USAID's 2021 findings showing that fewer than 15% of Basic Three pupils can read fluently, and Ampiah et al. (2018) identifying weaknesses in instructional practices.

Despite this comprehensive body of global and regional evidence, there is a significant empirical gap in Ghana regarding the establishment of continuous literacy monitoring systems and targeted school-level intervention strategies. Existing national

evaluations highlight the literacy crisis but fail to provide mechanisms for ongoing tracking of learner progress. This study is particularly relevant as it aims to fill this void by implementing the Acadience Learning Online (ALO) platform as a continuous monitoring tool within a Transition to English (T2E) instructional program. By doing so, it seeks to provide practical evidence on how to enhance early-grade literacy through data-driven instruction in the unique context of non-GALOP public schools in Ghana.

In summary, this thesis aims to address critical gaps in early literacy interventions by leveraging digital progress monitoring to enhance instructional effectiveness, thereby directly responding to the urgent needs identified in the literature and Ghana's educational landscape.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.0 Introduction**

This chapter outlined the methodology for the study.

#### **3.1 Philosophical Underpinning**

Pragmatism is a fitting philosophical framework for tackling literacy challenges faced by Basic Three students in Ghana, as it prioritises practical solutions and emphasises adaptability to real-world contexts (Creswell & Plano Clark, 2017; Morgan, 2014 ). Through a mixed-methods approach that integrates quantitative data, such as reading scores and standardised assessments, with qualitative insights from teachers' and students' experiences, the research developed targeted interventions to enhance reading outcomes. This flexibility enabled the study to remain responsive to emerging insights, allowing for adjustments to strategies based on real-time data. Ultimately, this approach aimed to bring about meaningful changes in teaching practices and literacy policy (Dewey, 1931). By employing this pragmatic perspective, the research aimed to bridge the divide between theory and practice, facilitating a deeper understanding of effective methods for improving literacy education.

#### **3.2 Research Approach**

This study adopted a concurrent embedded mixed-methods approach as the most appropriate strategy for investigating the multifaceted nature of student literacy development within a real-world educational context. The primary emphasis was placed on quantitative data, which enabled the researcher to establish benchmarks for students' initial language proficiency, implement targeted interventions, and monitor progress using the Acadience Learning Online (ALO) tool.

However, a purely quantitative approach would not have adequately captured the contextual factors influencing the intervention's implementation and impact. To address this, qualitative data were embedded to provide deeper insight into how digital monitoring tools informed instructional practices within the Transition to English (T2E) framework. Through teacher observations, reflections, and contextual documentation, the qualitative component added interpretive depth and helped explain the patterns observed in the quantitative data (Creswell & Plano Clark, 2018).

This design was justified because it enabled a holistic understanding of the research problem, integrating measurable outcomes with contextual interpretation. The concurrent nature of the approach facilitated real-time data triangulation, thereby enriching the study's internal validity (Tashakkori & Teddlie, 2010).

### **3.3 Research Design**

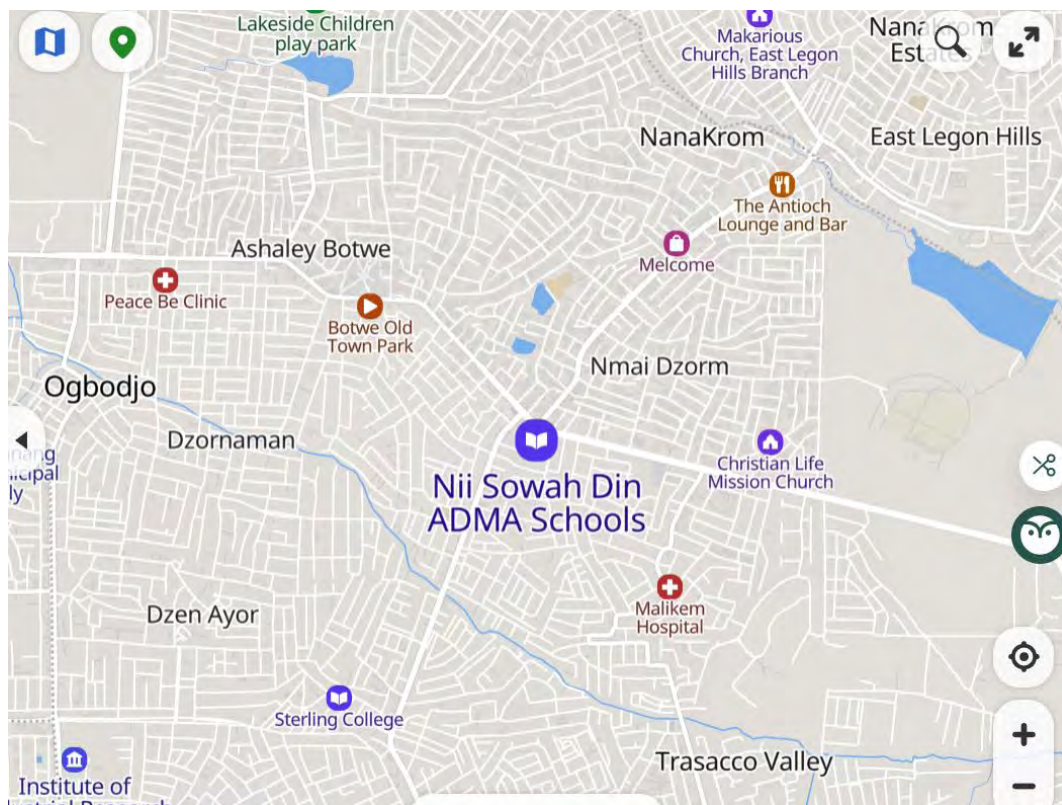
The study adopted an action research design due to its suitability for addressing context-specific educational challenges while simultaneously generating knowledge to inform broader practice. It employed the cyclical nature of Action Research, involving the stages of planning, action, observation, and reflection, to improve literacy instruction through collaborative digital monitoring. This was done through close collaboration with teachers and administrators to introduce the ALO within the T2E framework, evaluate its impacts and make iterative adjustments.

#### **Study Context**

The study focused on Nii Sowah Din Basic School in Adenta Municipality, Greater Accra, Ghana, which is part of the Transition to English (T2E) programme. Unlike many schools, it does not receive support from the Ghana Accountability for Learning

Outcomes Project (GALOP), making it a key site to evaluate the T2E curriculum's effectiveness without outside assistance.

By concentrating on Basic Three learners, the research aimed to assess literacy outcomes at a pivotal stage where students are expected to transition fully to English instruction. This phase is critical for identifying those who may require additional support before progressing to upper primary, where English proficiency becomes increasingly important.



**Figure 3.1** Map showing study setting

### **3.4 Population**

The population for this study comprised all Basic Three learners, their English classroom teachers, and key instructional leaders at Nii Sowah Din Basic School in the Adenta Municipality. This included the Headteacher, the Curriculum Lead, and

the School Improvement Support Officer (SISO), who collectively influence instructional planning and literacy provision within the Basic Three level.

### **3.4.1 Target Population**

The target population consisted of all Basic Three learners enrolled in the 2024/2025 academic year. These learners were the focus of the broader school-wide Transition to English (T2E) implementation and represented the group whose literacy outcomes the study sought to improve.

The accessible population comprised 80 learners (Class 3A = 36; Class 3B = 44) who were present and completed the Acadience Learning Online (ALO) baseline assessment (pretest). These learners formed the operational group upon which literacy progress, intervention responsiveness, and outcome trajectories were measured.

### **3.5 Sample Size**

A purposive sample of four struggling readers and four high-performing readers was selected. This eight-learner grouping was intentionally chosen to provide an information-rich, analytically manageable, and developmentally representative cohort for deeper examination of reading behaviours, instructional responsiveness, and literacy growth. Additionally, this was to provide an answer to research question two: To what extent does the integration of the T2E intervention with Acadience Learning Online (ALO) as a personalised approach improve reading fluency and comprehension among Basic Three students?

The group was deliberately stratified into two categories to deepen the inquiry:

**Top-performing tier (4 learners):** Students with relatively stronger decoding and fluency who continued to experience comprehension challenges.

**Lower-performing tier (4 learners):** Students significantly below benchmark across all sub skills, requiring intensive support. These learners had significant decoding challenges.

This stratification was not intended for comparison in the experimental sense but to illuminate how different learner profiles responded to the same cycle of intervention, thereby generating practical insights for differentiated instruction.

### **Rationale for Selecting Eight Learners**

#### **1. Pedagogical Manageability for High-Fidelity Diagnostic Analysis**

Qualitative diagnostic tools such as miscue analysis, fluency tracking, and comprehension documentation require close, sustained, and repeated individual observation. Clay (2001) and Goodman (2014) emphasise that reading miscue analysis is most reliable when the researcher can capture subtle behaviours such as decoding attempts, error patterns, self-corrections, prosody shifts, and word attack strategies.

Such depth of analysis is only feasible with small *groups*. An eight-learner subsample ensures the researcher can conduct high-fidelity, cycle-by-cycle documentation without compromising accuracy or overwhelming the action research structure.

#### **2. Alignment with MTSS Evidence on Small-Group Intensive Intervention**

The Multi-Tiered Systems of Support (MTSS) literature posits that Tier 2 and Tier 3 intervention groups should not exceed 3–5 learners (Fuchs & Fuchs, 2006; Goodman & McIntosh, 2016 ). By selecting four high-tier learners (Tier 2 profile) and four low-tier learners (Tier 3 profile), the study strictly adheres to MTSS principles. This

supports instructional precision and diagnostic reliability during fluency and decoding intervention sessions.

### **3. Mixed-Methods Case Selection Principles Support Small, Contrasting Samples**

Mixed-methods scholars argue that qualitative components embedded within quantitative studies should use "information-rich cases" rather than broad samples (Teddlie & Yu, 2007). Contrasting cases (high-tier vs. low-tier) enable cross-case comparison, illustrate divergent learning trajectories, explain quantitative trends, and identify instructional barriers. An eight-learner cohort maximises contrast while preserving depth.

### **4. Feasibility Within an Action Research Cycle**

Action research requires rapid implementation cycles, immediate reflection, ongoing data capture and instructional adjustments. A larger sub-sample would dilute the researcher's ability to conduct consistent observations and reflections. Stringer (2014) stresses that action research thrives on manageable units of analysis that allow iterative refinement. Eight learners ensure feasibility without compromising analytical rigour.

In summary, the sampling approach balanced whole-class engagement (to address universal instructional failure), targeted sub-sampling (to capture diverse learner trajectories), and multi-stakeholder inclusion (to triangulate perspectives). This design ensured that the action research cycle was grounded in equity, reflective practice, and systems awareness, generating findings that were both locally transformative and theoretically informative for literacy improvement in resource-constrained schools.

The English teacher for class 3A and two administrators, the head teacher and curriculum lead, were purposively selected. These individuals were directly involved in:

1. implementing the intervention
2. interpreting ALO data
3. supervising literacy instruction
4. Focus group discussions

Qualitatively, their perspectives were critical to understanding implementation fidelity and institutional factors influencing literacy outcomes. Cohen et al. (2018) emphasise that purposive sampling is essential when selecting participants with specialised knowledge.

### **3.6 Instrumentation**

The study employed the following instruments:

1. ALO standardised tool
2. Semi-structured Interviews (for teachers and school leadership)
3. Semi-structured interaction guides (for learners and focus group meetings)
4. Document Scrutiny
5. Naturalistic Observation

#### **3.6.1 Acadience Learning Online standardised tool**

ALO is the digital version of the Acadience Reading K-6 tool, which uses a set of measures to assess essential early literacy and reading skills for kindergarten through 6th grade. ALO was adopted as a significant tool for gathering quantitative data for this research. Kimanski (2021) asserts that reading trajectories are established early,

readers on a low trajectory tend to stay there, and finally, readers on a low trajectory tend to fall further. This can, however, be curtailed if assessment is tailored to focus on essential indicators of learning outcomes, instruction is focused on teaching essential early literacy and reading skills, and data from assessment are used to inform educational decisions aimed at addressing systemic and individual challenges that impede desirable outcomes. The contextual elements of Nii Sowah Din make the ALO an ideal assessment tool for tracking the effectiveness of the T2E programme, due to its economical and efficient nature, as it is both easy and quick to use. To ensure contextual alignment, Acadience Incorporated was contacted with the research objectives, and Ghana was officially added to the tool, making it the second African country, after Kenya, to be on it.

### **3.6.2 Semi-structured questionnaire**

An initial semi-structured questionnaire was administered to the project's prominent participants (the two English teachers, the curriculum lead, and the head of school) prior to the pretest. The questionnaire specifically aimed to document teachers' prior experiences, confidence, and training with T2E, evaluate the fidelity of its implementation, and identify gaps in resources and materials. The instrument further sought to capture teachers' observations of student responsiveness to T2E activities, explore challenges in aligning the programme with the existing literacy curriculum, and probe expectations regarding the use of ALO for progress monitoring. In relation to this study, the questionnaire directly supports Research Question 3 by providing evidence of the challenges and successes teachers and students experience in implementing ALO within the T2E framework, and how these contextual factors influence literacy outcomes.

### **3.6.3 Acadience Learning Online (ALO) Progress Monitoring**

ALO has unique features that make it a solid tool for implementing any literacy or intervention programme. One of these key features is its progress-monitoring capability. Weekly assessments were conducted to track learner growth across the intervention period.

This tool facilitated continuous data collection to inform instructional responsiveness, addressing Research Questions 1 and 2. ALO's alternate forms and digital dashboard allow educators to visualise individual and group progress, supporting data-driven decisions in reading fluency and comprehension.

### **3.6.4 Acadience survey**

The ALO has another unique embedded characteristic called the survey. The survey has three distinctive uses: it can be used to validate benchmark results and/or to ascertain learners' instructional levels to help determine the appropriate starting point for interventions or class engagements. The acadience survey was administered after baseline assessment to validate initial performance data and group learners by instructional levels.

This diagnostic component ensured learners were appropriately matched with instructional strategies. It supports Research Question 2 by enabling differentiated interventions grounded in validated data. The survey strengthens internal validity by confirming groupings before the intervention.

### **3.6.5 Semi-Structured Interview Protocol**

Semi-structured interviews were conducted with teachers and administrators to capture insights into the use, challenges, and perceived benefits of ALO. Aligned with

Research Question 3, these interviews offered qualitative depth regarding the implementation experience. They explored instructional shifts, administrative support, and the integration of data into decision-making processes. These were situated at strategic points within the data collection: post-baseline, during intervention, and post-intervention, to gather information to guide data-directed strategies guided by qualitative insights.

### **3.6.6 Focus Group Discussion Guide**

Both learners and teachers, along with administrators, were engaged in focused meetings, facilitated by sampled learners, to capture their perceptions of the intervention and their reading progress.

Focus groups offered student-level insights into the digital monitoring experience, directly addressing Research Question 3. Learner feedback helped assess engagement, motivation, and affective responses to the ALO-based instruction.

### **3.6.7 Observation Templates**

An observation template was designed to document how ALO data were integrated into classroom instruction and how learners responded to intervention strategies. These templates captured instructional fidelity and learner engagement, aligning with Research Question 3. Observations provided an objective account of how real-time data shaped teaching practices.

### **3.6.8 Document Scrutiny**

This was used to analyse lesson plans. Schools using the T2E programme strictly used the T2E teacher guides and resources. Teachers, therefore, do not have personal lesson plans. The T2E manual was reviewed for its alignment with the ALO tool. The

manuals were used to guide the interventions. The already existing ASER tool was reviewed. This was used to cross-validate and triangulate ALO baseline results and to help group learners for interventions.

### **3.7. Reliability (Trustworthiness)**

Multiple data sources (quantitative assessments, interviews, and observations) were used to corroborate findings. Triangulation ensured a well-rounded analysis and reduced the limitations associated with using a single method (Greene et al., 1989). Member checking and audit trails were employed to enhance research trustworthiness. This action research cycle was grounded in equity, reflective practice, and systems awareness, generating findings that were both locally transformative and theoretically informative for literacy improvement in resource-constrained schools.

### **3.8 Validity**

Acadience Learning Online, a digital monitoring version of Acadience Reading K-6, is a standardised instrument for measuring English language proficiency. This was used in accordance with standard procedures.

### **3.9 Instrument Reliability (ALO)**

The ALO has robust research underpinnings, making it a reliable, standardised tool for assessing English language proficiency. Attached is a table outlining the research reliability findings. Although the Acadience Learning Online (ALO) tool was initially developed and standardised in the United States, its reliability indices were validated through a pilot adaptation in Ghana, confirming its contextual relevance and technical adequacy for early-grade literacy assessment.

**Table 3.1 Summary of Research Reliability (ALO)**

**Summary of single and three-form Reliability estimates for Acadience Reading K-6 measures.**

Measure	Type of Reliability					
	Inter-Rater		Alternate form		Test - Retest	
	Single form	Three form	Single form	Three Form	Single form	Three form
First Sound Fluency	.94	.98	.82	.93	-	-
Letter naming Fluency	.99	1.00	.86	.95	-	-
Phonemic Segmentation	.96	.99	.44	.70	-	-
NWF Correct Letter Sound	.99	1.00	.71-.85	.88-.94	.76	.90
NWF Whole Word Read	.99	1.00	.90 - .92	.96 -.97	.70	.88
ORF Single passage: WC/min	-	-	.83 - .95	.92 - .97	-	-
ORF Triad: WC/min	-	-	-	.95 -.98	-	.97-.98
ORF Triad: accuracy	-	-	-	.76 -.88	-	.80-98
ORF Triad: Retell	-	.92 - .99	-	.65 - .81	-	.27 - .69
Maze adjusted Score	.98 - .99	.99 - 1.00	.66 - .81	.85 - .93	-	-
Reading Composite score	.97 - .99	-	.66 - .97	-	.81 - .94	-

Source: Dewey, E. N., Powell-Smith, K. A., Good, R. H., Kaminski, R. A. (2015).

Acadience™ Reading K-6 Technical Adequacy Brief. Eugene, OR: Acadience Learning.

### **3.10 Procedure for Data Collection**

An introductory letter was obtained from the Department of Special Education at the University of Education. This was followed by securing official approval and preparing stakeholders for collaborative engagement. The researcher obtained clearance from the Ghana Education Service (GES) in the Adenta Municipality and convened a planning meeting with the Headteacher, Curriculum Lead, and School Improvement Support Officer (SISO) on 24th January 2025. This meeting outlined the study objectives, clarified how the Acadience Learning Online (ALO) tool would complement the Transition to English (T2E) framework, and assigned roles and responsibilities.

The researcher participated in a 4-week asynchronous training program with Acadience Incorporated, USA, covering ALO administration, progress monitoring, and data interpretation to ensure ALO administration fidelity. The researcher and a research assistant undertook this training to reduce bias by equipping the assistant to act as a peer-review partner. Ethical clearance was obtained through informed parental consent and age-appropriate learner assent. Learners were registered on the ALO platform, with teachers and administrators granted transparent access to progress records.

A pilot study was conducted with 10 randomly selected Basic Three learners, balanced by gender. The pilot tested the ALO Universal Screener (decoding, fluency, comprehension), classroom observation templates for usability and transparency, and draft interview questions for teachers and leaders. Feedback from this pilot refined the clarity of instruments, adjusted pacing, and confirmed ALO's applicability in the

Ghanaian context (with Ghana added to its jurisdictions). This pilot stage constituted the first iteration of the reflection loop, ensuring readiness before full-scale action.

All Basic Three students underwent initial reading assessments to establish their literacy levels. Learners identified as struggling learners had their data validated using the Acadience survey and existing documents. Digital, data-based interventions was applied to the selected sample over six weeks. The T2E remediation materials was used for intervention. Digital scores using ALO was collected weekly to assess progress. Qualitative data in the form of focus group discussions, observations, naturalistic interactions and semi-structured interviews were used at key points during the study to provide additional insights.

### **3.11 Ethical Considerations**

Ethical integrity was central to the design and implementation of this study. The research adhered to the ethical standards for educational research established by the University of Education, Winneba, the Department of Special Education, and the Ghana Education Service (GES), Adenta Municipality. Approval to conduct the study was formally obtained through a letter of authorisation from both the Department of Special Education and the GES Adenta Municipal Directorate. Copies of these letters were shared with the school administration before data collection commenced.

#### **Informed Consent and Assent**

Prior to the commencement of the study, all stakeholders, including teachers, parents, and learners, were fully briefed on the objectives, procedures, and potential benefits of the research. Parental consent forms were distributed to parents and guardians, providing clear information on the study's purpose, voluntary participation, and the right to withdraw at any time without penalty. To ensure child protection, learner

assent forms were designed in age-appropriate language and administered orally and in writing to secure learners' voluntary participation.

Teachers and administrators also signed informed consent forms, confirming their understanding of their roles and the non-evaluative nature of their participation. Consent discussions emphasised that participation would not affect professional appraisals or academic assessments.

### **Confidentiality and Anonymity**

All participants were assured of strict confidentiality and anonymity throughout the study. Learners and teachers were identified in all records, transcripts, and reports using coded pseudonyms rather than real names. Class lists and ALO performance data were anonymised before analysis and presentation. During interviews and focus group discussions, participants were reminded not to share personal details outside the research setting.

The researcher maintained a confidentiality agreement with the research assistant to ensure ethical handling of all information. Classroom observations and document reviews were conducted in ways that avoided intrusive recording or public exposure of participants' identities.

### **Data Protection and Storage**

All quantitative and qualitative data were stored securely in accordance with institutional and data protection protocols. Digital data from Acadience Learning Online (ALO) was protected using password-restricted accounts accessible only to the researcher and the assistant assessor. Hard copies of questionnaires, consent forms, and observation templates were kept in a locked cabinet in the researcher's office.

Electronic files were stored on an encrypted external drive and backed up on a secure, password-protected cloud service.

Data were retained for three years following the completion of the study, after which all identifiable information will be permanently deleted or shredded. Reports and publications will contain only aggregated data to protect individual identities.

### **Ethical Transparency and Research Integrity**

Throughout the research process, transparency, voluntary participation, and respect for human dignity guided all interactions with participants. The inclusion of informed consent, assent, and formal institutional approval ensured compliance with both national educational research ethics and international best practices. By prioritising participant confidentiality, data protection, and contextual sensitivity, the study upheld ethical rigour while fostering trust and collaboration among stakeholders at Nii Sowah Din Basic School.

### **3.12 Data Analysis**

#### **Quantitative Analysis**

Descriptive Statistics were used to analyse quantitative data and summarise student literacy levels before and after interventions. This gave a clear picture of central tendencies (mean, median, mode) and variability (range, standard deviation, variance).

ALO provided trend analysis by identifying changes in reading proficiency scores over time.

Pre-test and post-test reading scores were gathered from Acadience Learning Online (ALO) assessments. Data was cleaned and organised to remove incomplete responses, and students will be sorted into performance categories. Statistical calculations were

conducted, and the data were visualised. Acadience has a visualisation feature that lets you view data in graphs for both individuals and groups. Data were interpreted to show patterns of improvement or gaps in student performance and to establish a baseline for comparing intervention effectiveness.

### **Qualitative Data Analysis**

Qualitative data were generated from classroom observations, teacher interviews, learner focus groups, and leadership discussions. Reflexive thematic analysis was employed to identify and interpret recurring patterns of meaning across participants, following Braun and Clarke's foundational and contemporary articulations of their approach (Braun & Clarke, 2006, 2019, 2021). This approach allowed for systematic coding, theme development, and theory-informed interpretation of participant experiences, while drawing on established criteria to enhance credibility, dependability, and overall trustworthiness of the analysis (Nowell et al., 2017)

**Coding Process:** Interview and focus group transcripts were first open-coded to identify key ideas related to instructional shifts, learner engagement, and challenges with ALO integration.

**Theme Development:** Codes were clustered into higher-order themes, including teacher adaptation, learner motivation, technology usability, and systemic sustainability.

**Observation Logs:** Classroom observation templates were reviewed to confirm fidelity to ALO-informed practices and cross-checked against teacher self-reports.

**Document Reviews:** Lesson plans, dashboards, and progress records were analysed for coherence between planned instruction and delivered practice.

These qualitative insights enriched the reflective phase of action research by linking numerical growth data with the lived experiences of learners, teachers, and leaders.

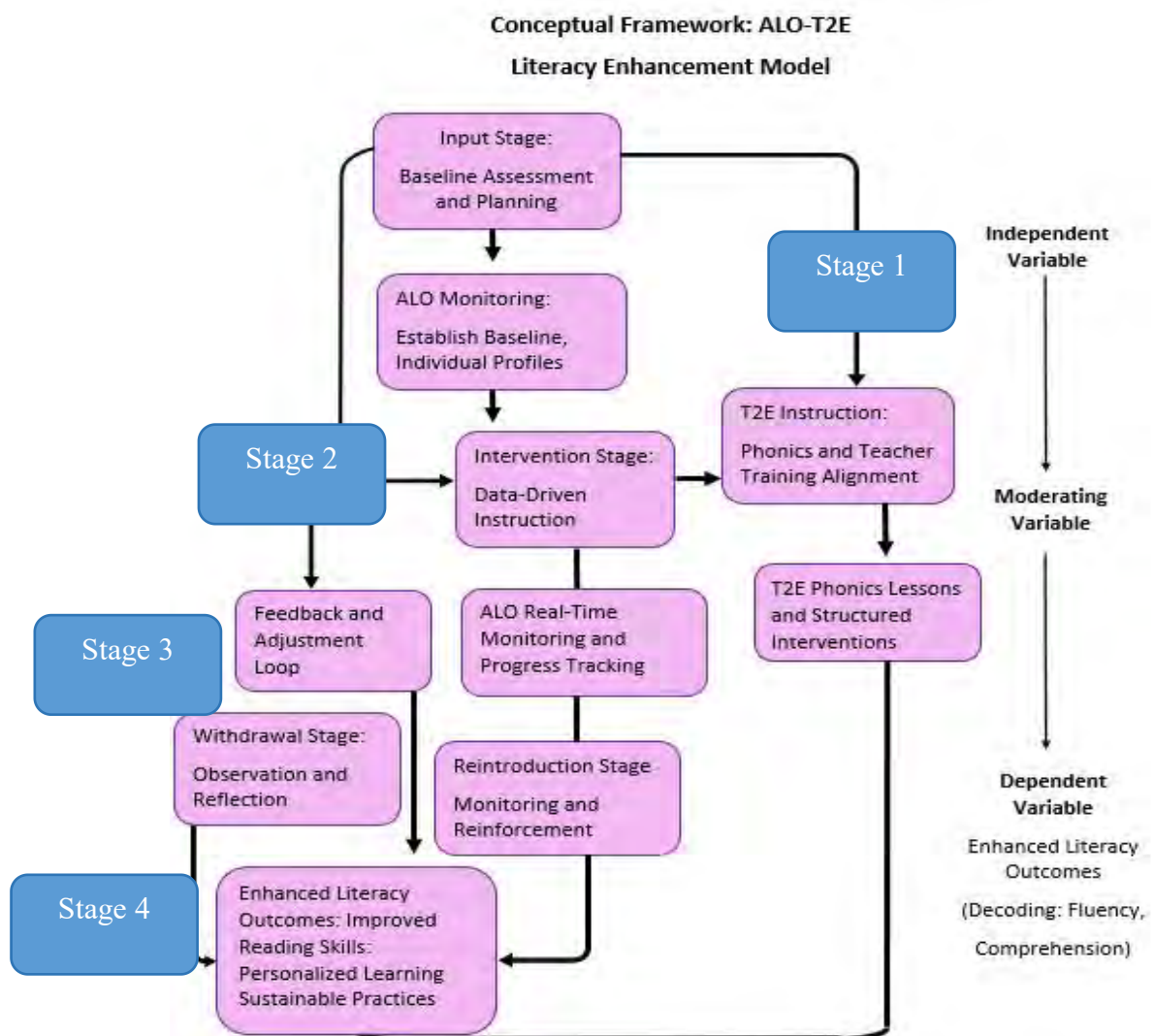
Data analysis in this study was not treated as a separate, post-hoc activity but as an integral component of the action research cycle. Quantitative analysis provided ongoing evidence of literacy growth, while qualitative analysis captured the reflective voices of teachers, learners, and leaders, together enabling both localised improvement and transferable insights.

### Action Research Cycles

This study used a four-cycle action research model adapted from Kemmis and McTaggart (1988). The cycles involved systematic planning, action, observation, and reflection to improve literacy instruction by integrating Acadience Learning Online (ALO) within the T2E framework (Kemmis & McTaggart, 1988). A figure from the Interaction Design Foundation was used to visually illustrate the cyclical nature of the design adopted in this study (Interaction Design Foundation, 2025).



**Figure 3.2 Action Research Cycles**



**Figure 3.3 Conceptual Framework with different stages of the Action Research Cycle**

*Source: Conceptual framework designed by researcher 2025*

Figure 3.3 illustrates the different stages of the action research loop within the conceptual framework, indicating which stage in the action cycle the researcher performed a specific action.

## **Cycle 1: Planning**

### **Pre Intervention**

#### **Preparation and Ethical Clearance**

The first stage focused on securing official approval and preparing stakeholders for collaborative engagement. The researcher obtained clearance from the Ghana Education Service (GES) in the Adenta Municipality and convened a planning meeting with the Headteacher, Curriculum Lead, and School Improvement Support Officer (SISO) on 24th January 2025. This meeting outlined the study objectives, clarified how the Acadience Learning Online (ALO) tool would complement the Transition to English (T2E) framework, and assigned roles and responsibilities. The location of Nii Sowah Din on a map is attached (as Appendix I)

To ensure fidelity in administration, the researcher and a research assistant undertook a four-week asynchronous training with Acadience Incorporated, USA, covering ALO administration, progress monitoring, and data interpretation. This training reduced bias by equipping the assistant to act as a peer-review partner. (certificate attached as appendix A). Ethical clearance was obtained through informed parental consent and age-appropriate learner assent. (Sample signed assent and consent forms are attached as Appendix D)

Learners were registered on the ALO platform, with teachers and administrators granted transparent access to progress records.

#### **Pilot Study**

A pilot study was conducted with 10 randomly selected Basic Three learners at Nii Sowah Din school, balanced by gender. The pilot tested; ALO Universal Screener

(decoding, fluency, comprehension), classroom observation templates for usability and transparency and draft interview questions for teachers and leaders.

Feedback from this pilot refined the clarity of instruments, adjusted pacing, and confirmed ALO's applicability in the Ghanaian context (with Ghana added to its jurisdictions). This pilot stage constituted the first iteration of the reflection loop, ensuring readiness before full-scale action.

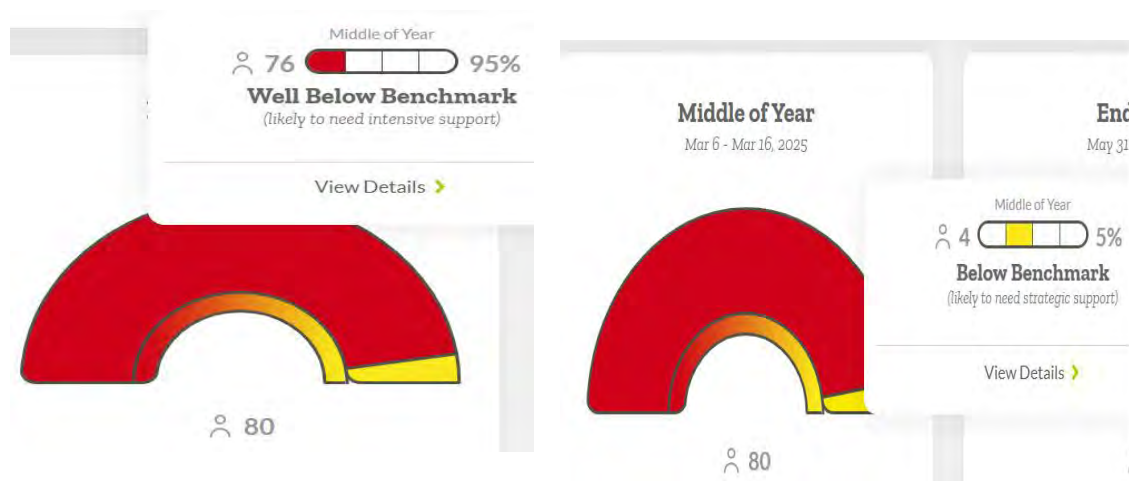
## **Cycle 2: Action**

### **Baseline Assessment (Pre-test)**

The action phase began with administering the ALO Universal Screener to all Basic Three learners (n = 80). Two days were used for data collection. A day each for each class. Scores were triangulated with ASER assessments and teacher observations to ensure contextual accuracy.

All 80 learners participated in baseline ALO assessments, following MTSS guidelines for universal screening to identify instructional failures (McIntosh & Goodman, 2016). This aimed to evaluate the effectiveness of the T2E programme at Nii Sowah Din School.

Results revealed a universal Tier 1 failure: all learners performed below the benchmark.



**Figure 3.4 Pretest result as shown on the ALO dashboard.**

The results from the Acadience tool were validated with document analysis and qualitative data from teachers. All the children who were identified to have higher composite scores were also on level 6 of the ASER tool. The ASER tool had only 11 out of the entire learner population met the highest mark on level 6; that is, only 11 learners met the grade level expectation. This confirms the Acadience result, indicating a collapse of core instruction. All 11 learners were girls. The Acadience tool identified two learners with high composite scores (though not at grade level), and both were girls. This discrepancy is accounted for by the fact that the ALO focuses on comprehension (Retelling and Maze). This measure is not heavily emphasised by the ASER assessment tool. Almost all learners fell below grade level on ALO due to inadequate comprehension skills. Only one boy was captured at level 6 on the ASER assessment tool, and his grade at that level was very low. (ASER assessment tool attached as Appendix F). Results were shared in a focus group meeting with the head teacher, SISO curriculum lead and English teachers (Excerpts from the discussion were captured in the researcher's diary. (attached as Appendix H)

## **Tier Grouping and Intervention Design**

To respond equitably, the entire Class 3A (36 learners) received whole-class intervention, while eight learners were purposively selected for more in-depth tracking.

### **3.13 Participant Selection**

A purposive, context-driven sampling strategy was employed. The goal was not statistical representativeness, but to capture the multiple perspectives necessary to improve literacy practice at Nii Sowah Din School while documenting outcomes across different tiers of learners.

At the diagnostic stage, all available Basic Three learners ( $n = 80$ ; Class 3A = 36, Class 3B = 44) were assessed using Acadience Learning Online (ALO). The universal pretest confirmed that 100% of learners were performing below benchmark expectations, highlighting a possible systemic Tier 1 failure under the MTSS framework.

#### **3.13.1 Classroom Intervention Group**

A purposive sampling strategy was used to select 36 learners from Class 3A as the principal intervention group. Although both 3A and 3B showed below-benchmark performance, 3A was selected for the following reasons:

The selection of Class 3A as the primary intervention group was based on purposive sampling principles, which prioritise identifying cases that provide the most insight into the research phenomenon (Patton, 2015). Class 3A, as the most instructionally vulnerable cohort, exhibited a higher proportion of struggling readers and notable deficits in decoding and accuracy compared to Class 3B. This targeted approach

maximises learning from cases where issues are most pronounced, making Class 3A ideal for examining how ALO can address significant foundational literacy gaps. Additionally, larger class sizes are linked to reduced individualized support and increased teaching challenges, particularly in literacy instruction (Hattie, 2015). Thus, Class 3A represented a more authentic environment for testing the ALO-supported intervention. The 3A teacher committed to full participation and maintained consistent learner attendance necessary for progress monitoring.

### **Data as A significant tool for Grouping**

After the pretest, learners were grouped according to their needs. Acadience and T2E both have strategies for grouping learners according to their needs to facilitate strategic classroom engagement and effective interventions. Two groups emerged from the data collected. Basic three learners are usually assessed on two core skills on the Acadience tool:

Oral Reading Fluency – Word correct (Words Per minute) and Accuracy (Reading precision)

Two learners were on the top tier with their composite skill score but there were other learners whose other skills were close to the other two. Data was used to group learners into 4 groups:

**Table 3.2 Grouping Composite scores**

<b>Group</b>	<b>Range</b>
Group 1	185 - 275
Group 2	105 - 151
Group 3	8 - 19
Group 4	0

The Acadience survey, an embedded tool in the ALO suite, was administered to determine the instructional levels of the learners. Determining the instructional level enables teachers or interventionists to identify gaps and intervene strategically. Learners were then placed in two main groups. Readers and non-readers. This was due to the survey results. Groups one and two had similar needs (comprehension enhancement). Group 3 and 4 (needed foundational skills of the Alphabetic principle, phonemic awareness and phonics).

An Action plan was designed, and learners were placed on the Acadience progress monitoring. This tool helps track the effectiveness of an intervention in real-time, enabling timely decision-making. This also ensures individualised instruction to tackle the unique challenges of learners.

These were stratified into:

**Top-Performing Tier (4 learners):** Adequate fluency, weak comprehension.

**Lower-Performing Tier (4 learners):** Significantly below benchmark in all sub-skills.

Instructional designs were differentiated:

Top Tier → comprehension strategies (summarising, inferencing, retelling, mental imaging vocabulary).

Lower Tier → decoding, fluency-building, scaffolded comprehension. The grouping sheets are attached as (Appendix G)

Daily T2E instruction was combined with tier-specific pull-out sessions, tailored to each learner's Zone of Proximal Development (ZPD).

## Intervention Phase

A six-week data-driven intervention plan was developed. Below is a table illustrating the six-week intervention plan:

**Table 3.3: Six-Week Instructional Scope and Sequence**

Week	Tier 1: Whole Class (3x weekly)	Tier 2 High Tier (3x weekly)	Tier 2 Low Tier (4x weekly)
Week 1	Phonemic Awareness & Phonics – oral blending, segmenting, short vowel families, letter–sound drills	Advanced Phonics & Prosody – multisyllabic decoding, echo reading, vocabulary from context	Letter Recognition & Sound Awareness – alphabet games, letter–sound matching, oral blending with picture prompts
Week 2	Vocabulary & Fluency – high-frequency words, echo reading, word attack practice	Comprehension Monitoring – guided oral reading, think-aloud modelling, partner retell Context clues (Maze Activities)	Basic Phonics & Decoding – short vowel families, blending/segmenting with counters and letter cards
Week 3	Phonics & Comprehension – digraphs (sh, ch, th), comprehension “stop and think,” oral retell	<b>Weekly Assessment</b> Vocabulary & Word Attack – prefixes/suffixes, advanced sight words, word sorting. Comprehension Visualization/monitoring	<b>Weekly Assessment</b> Phonemic Awareness – sound substitution, syllable clapping, phoneme deletion
Week 4	Fluency & Vocabulary – decoding practice, categorising new words, oral vocabulary expansion	Fluency Development – timed phrase reading, reader’s theatre, prosody feedback	Word Building & Fluency – CVC/CCVC words with tiles, repeated word reading, vocabulary reinforcement
Week 5	Phonics & Comprehension – long vowel patterns (a_e, i_e, o_e), oral prediction, visualisation	<b>Weekly Assessment</b> Comprehension Strategies – sequencing, visualisation prompts, oral summarisation	<b>Weekly Assessment</b> Advanced Letter–Sound Correspondence – digraphs (sh, ch), blending drills, flashcard decoding
Week 6	Integrated Fluency & Comprehension – repeated oral reading, group discussions, guided retell	<b>Weekly Assessment</b> Integrated Skills – decoding + vocabulary + fluency + comprehension applied in short texts	<b>Weekly Assessment</b> Integrated Review – revisiting all sounds, decoding sentences, simple oral comprehension

*Source: Researcher’s field intervention plan 2025*

Following the six-week instructional sequence presented in Table 3.1 the frequency of instructional sessions was deliberately differentiated in alignment with the Multi-Tiered System of Supports (MTSS) and Response to Intervention (RTI) frameworks. Whole-class (Tier 1) instruction was delivered three times weekly, ensuring all students had access to core literacy practices in phonemic awareness, phonics, fluency, and comprehension. This universal support aimed to strengthen the reading foundation for the entire cohort. Support was provided at two levels. Learners in the High Tier (the more advanced group) received Tier 2 instructions. They were pulled out three times a week to receive targeted instruction in prosody, comprehension monitoring, advanced phonics, and vocabulary development. This frequency was sufficient to reinforce without removing them excessively from general instruction. In contrast, learners in the Low Tier received more intensive intervention (Tier 3), four sessions weekly focused on foundational skills such as letter recognition, blending, and decoding. This increased frequency reflected the urgency of closing foundational gaps to prevent frustration and ensure readiness for grade-level reading. Instructional groupings were maintained at the students' instructional levels, consistent with RTI principles, and progress monitoring was conducted weekly for the Low Tier and bi-weekly for the High Tier to guide adjustments (Fuchs & Fuchs, 2006; Vaughn & Fletcher, 2012). Sample activities have been attached as (Appendix K-L)

### **Cycle 3: Observation/Weekly Progress Monitoring**

Over six weeks, learners were monitored through ALO alternate-form assessments (quantitative tracking of decoding, fluency, comprehension). This was used to track learner improvement to make instructional decisions.



**Figure 3.5 Acadience dashboard showing weekly progress**

### Qualitative Observation and Documentation

This involved classroom observations, which documented teacher fidelity to intervention plans and real-time adaptations. Document reviews (of lesson plans and dashboards) checked alignment between planned and actual instruction, and learner focus groups explored perceptions of the intervention and self-reported reading progress.

Additionally, semi-structured interviews with teachers and administrators provided valuable insights into their implementation experiences, challenges, and decision-making processes.

This stage served as the systematic “observe” phase, ensuring both growth metrics and contextual experiences were captured.

### Cycle 4: Reflection

#### Data Triangulation and Analysis

Reflection occurred through integration of multiple data sources:

Quantitative: ALO and ASER results, progress monitoring growth trends.

Qualitative: Teacher/administrator interviews, learner focus groups, observation logs. Findings revealed measurable gains in both tiers, with upper-tier learners consolidating mastery and lower-tier learners narrowing gaps despite remaining below the benchmark. Teacher reflections confirmed that ALO reshaped instructional decision-making, while leadership perspectives highlighted the systemic need for sustainable digital monitoring.

### **Post-Intervention Assessment**

Final ALO assessments were conducted on learners from Basic 3 A. This took 3 days. This was done to ensure that as many learners as possible were captured, given the attendance inconsistency. Post-test scores were compared to baseline scores, providing concrete evidence of progress. The reflection process emphasised both learner growth and systemic lessons for literacy instruction, feeding directly into recommendations for practice and policy.

## **3.14. Data Analysis**

### **3.14.1 Quantitative Analysis**

#### **Quantitative Data Analysis (Observation Stage)**

Quantitative data were derived primarily from the Acadience Learning Online (ALO) screener and progress monitoring tools, complemented by the Annual Status of Education Report (ASER) results. Analysis focused on descriptive statistics, visualisation of growth patterns, and benchmark comparisons.

**Pretest Diagnostics:** Baseline ALO scores (oral reading fluency, accuracy, retell, Maze) were compared with grade-level benchmarks to confirm systemic instructional gaps.

**Progress Monitoring of sampled learners:** Weekly ALO results were tracked, with growth represented in line graphs and dashboards. These visuals allowed both the researcher and the Class 3A teacher to make real-time instructional adjustments during the observation phase.

**Tier Comparisons:** The growth trajectories of the top-performing and lower-performing tiers were compared to capture diverse responsiveness to interventions. This analysis was not for inferential generalisation but to illuminate how different learner profiles engaged with the action cycle.

**Post-test Assessment:** Endline ALO results were compared with baseline measures to quantify literacy gains in decoding, fluency, and comprehension.

This analysis stage directly supported the observation phase of action research, producing immediate insights for iterative decision-making.

All quantitative instruments including ALO, ASER, and the Acadience Survey were analyzed using descriptive statistics to summarize learner performance, instructional grouping patterns, and progress trends. These analyses provided actionable insights without attempting inferential generalization. Qualitative instruments; interviews, focus groups, and observations were analyzed thematically and triangulated to enhance validity. Together, these tools ensured a rigorous yet context-sensitive evaluation of how digital progress monitoring supports literacy instruction within Nii Sowah Din Basic School.

## **CHAPTER FOUR**

### **PRESENTATION AND ANALYSIS OF RESULTS**

#### **4.1 Introduction**

This chapter presented results and analysis from the research in relation to the research objectives:

1. To assess the utility of real-time digital progress monitoring through Acadience Learning Online (ALO) in improving Basic Three students' reading outcomes.
2. To determine the extent to which personalised interventions, specifically the integration of T2E with ALO digital monitoring, enhance reading fluency and comprehension outcomes for Basic Three students.
3. To identify the challenges and successes experienced by teachers and students during the implementation of ALO and evaluating how these factors influence the effectiveness of literacy interventions.

#### **4.2 Pretest Results**

##### **4.2.1 .Research Question one: How effective is real-time progress monitoring through ALO in improving Basic Three students' decoding, fluency, and comprehension outcomes?**

The objective of this research question was to determine whether real-time digital progress monitoring through Acadience Learning Online (ALO) could improve the decoding, fluency, and comprehension performance of Basic Three learners within the context of the Transition to English (T2E) instructional framework. The results are presented in two phases: pre-intervention (baseline) and post-intervention (after six weeks of ALO-guided instruction).

### 4.2.2 Pretest Results

Table 4.1 below presents the pre-intervention (baseline) scores for the Basic Three cohort. These results show that the majority of learners were performing well below benchmark across all literacy measures.

**Table 4.1. Pretest Scores for Basic Three (N = 80)**

Measure	Category	Number of Learners	Percentage of Population (%)
Composite Score	Well Below Benchmark	76	95
	Below Benchmark	4	5
	At Benchmark	0	0
	Above Benchmark	0	0
ORF – Words Correct	Well Below Benchmark	74	92
	Below Benchmark	4	5
	At Benchmark	1	1
	Above Benchmark	1	1
ORF – Accuracy	Well Below Benchmark	69	86
	Below Benchmark	7	9
	At Benchmark	3	4
	Above Benchmark	1	1
Retell (n = 58)	Well Below Benchmark	55	95
	Below Benchmark	3	5
	At Benchmark	0	0
	Above Benchmark	0	0
Retell Quality (n = 58)	Below Benchmark	38	66
	At Benchmark	20	34
	Above Benchmark	0	0
Maze	Well Below Benchmark	74	90
	Below Benchmark	6	10
	At Benchmark	0	0
	Above Benchmark	0	0

*Source: Researcher's field data, ALO benchmark results, Nii Sowah Din Basic School (2024).*

**Table 4.2 Baseline ALO Pretest Reading Performance Across Five Key Measures for Basic Three Learners (N = 80)**

Measure	N	Mean	Standard Deviation (SD)
ORF WC Score (Fluency)	80	22.51	26.26
ORF Accuracy Score	80	47.54	39.93
Retell Score	58	4.74	6.10
Maze Adjusted Score	80	2.45	3.03
Reading Composite Score	80	52.49	71.62

*Source: Field Data, pretest results from Nii Sowah Din School 2025*

### **Pretest Analysis and Interpretation**

Table 4.1 gives the total number of learners captured during the pretest and the percentages of learners under each key skill. Table 4.2 provides the mean scores and standard deviation. The results reveal a pervasive literacy gap across decoding, fluency, and comprehension domains.

The analysis focuses solely on the Pretest data. The relevant measures are Oral Reading Fluency (Words Correct), Retell Score, Maze Adjusted Score, and the Reading Composite Score.

### **Retell Discrepancy Explanation**

The attrition in the number of learners at the retell level is attributable to their inability to meet the Oral Reading Fluency (ORF) words per minute (WPM) and accuracy thresholds, thereby hindering their transition to the retell level, which evaluates comprehension. This is the established protocol for utilizing the ALO. When learners' WPM falls below a specific threshold, they are prohibited from

advancing to the retell stage. (Acadience Reading K-6 Essential Workshop Manual, 2020)

### **Interpretation: Pretest Status**

The pre-test descriptive analysis establishes the baseline reading achievement of the Basic 3 student cohort prior to intervention. The results revealed a population with low initial achievement and extreme variability in performance.

#### **1. Overall Achievement (Reading Composite Score)**

The Reading Composite Score represents the initial overall reading proficiency of the students, yielding a mean of ( $M = 52.49$ ) with a notably high standard deviation of ( $SD = 71.62$ )

**Interpretation:** The standard deviation is significantly greater than the mean, which is the most prominent finding. This indicates a highly skewed distribution, where the majority of students are clustered at the lower end of the achievement scale. While the mean itself suggests low proficiency, the high variability underscores that the classroom contains a wide range of needs, from students with potentially foundational skill deficits (scores near zero) to those who may be performing near or above grade level (outliers). This finding provided strong empirical justification for the implementation of a differentiated intervention programme.

#### **2. Reading Fluency (ORF WC Score)**

The mean score for Oral Reading Fluency (Words Correct) was ( $M = 22.51$ ), accompanied by a large standard deviation ( $SD = 26.26$ ).

**Interpretation:** Similar to the composite score, the SD exceeds the mean, confirming the high initial heterogeneity in reading rate and accuracy. A mean of 22.51 words

correct per minute for a basic three baseline is typically well below established proficiency benchmarks, suggesting that a majority of the students have significant fluency deficits. These fluency weaknesses often serve as a bottleneck, impeding comprehension.

### **3. Reading Comprehension (Retell and Maze Scores)**

The two comprehension measures, Retell Score and Maze Adjusted Score, showed the lowest absolute means. The N=58 in tables 4.1 and 4.2 is a result of 22 learners' inability to decode at the required WPM to move on to perform retell.

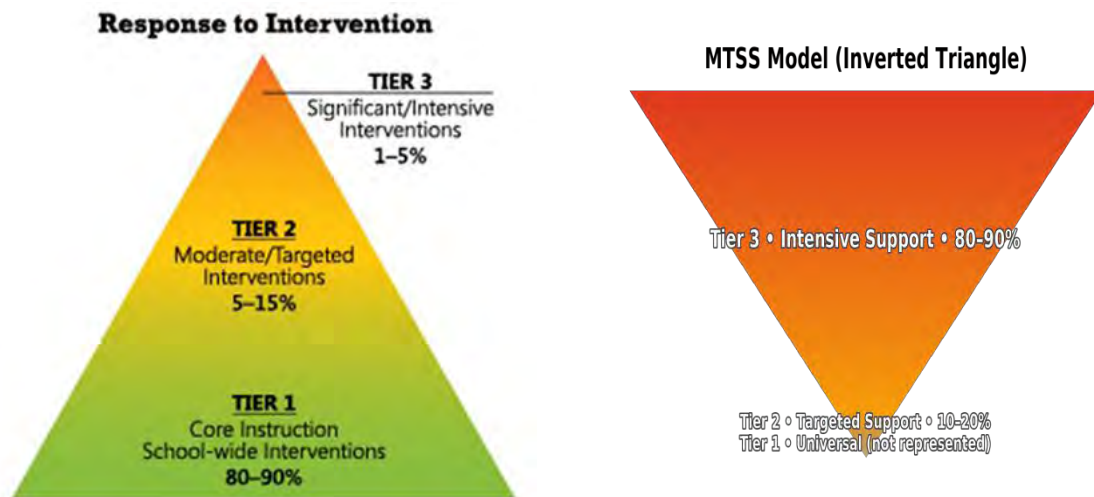
Retell Score: (M = 4.74) (SD = 6.10).

Maze Adjusted Score:(M = 2.45) (SD = 3.03).

**Interpretation:** The extremely low mean scores suggest that students generally demonstrated poor ability to recall key details (retell) or construct meaning from text (Maze) at the pre-test stage. For both measures, the SD again exceeds the mean, indicating that while a few students could demonstrate adequate comprehension, the typical student was unable to complete the task successfully or scored near the minimum possible value. This establishes that poor comprehension is a widespread issue in the cohort at the start of the study period.

### **Implications for MTSS/RTI**

Every learner performed below the minimum benchmark across all domains, creating an inverted MTSS triangle in which Tier 3 (red) absorbed the entire cohort and Tier 1 (green) was virtually empty. Instead of the expected 80 percent proficiency under universal instruction, 100 percent of learners required intensive support, evidence of a systemic Tier 1 collapse.



**Figure 4.1 Normal MTSS Triangle versus Observed Inverted Structure at Pre-Intervention**

The figure contrasts the expected MTSS distribution for composite score or language proficiency level:

<b>Expected Tier Distribution</b>	<b>Actual at Nii Sowah Din</b>
Tier 1 (80 %)	Tier 1 (0%)
Tier 2 (15 %)	Tier 2 (5%)
Tier 3 (5%)	Tier 3 (95%)

The inversion underscores how ALO data re-defined staff understanding of instructional effectiveness.

### **Revealing Hidden Instructional Weaknesses**

Prior to ALO, the school relied on the T2E framework’s summative checks and teacher observation. These tools lacked diagnostic precision, thereby masking foundational reading deficits. Teachers perceived underachievement as an issue of individual learner effort rather than a flaw in core instruction. Below are observations that gave qualitative explanations to the quantitative results:

### **Document Analysis**

The ASER paper-based assessment tool utilised to monitor progress incorporates identical texts and vocabulary from Basic 1-3. A considerable number of children had encountered the assessment tool previously and were reading decodable words as sight words due to the memorization of these terms. This undermines the primary objective of employing the tool to evaluate decoding skills. Consequently, the results derived from the tool did not accurately reflect the mastery levels of specific learners.

The same assessment instrument is employed for diagnostic, formative, and summative evaluations across the three classes. This excessive familiarity with the tools fails to offer learners a diverse array of texts to accurately gauge their proficiency in decoding and fluency.

The ASER tool assessed mastery in decoding and fluency; therefore, many learners classified as high achievers were merely engaged in “word calling” rather than reading with genuine comprehension. The tool was deficient in sub-skills such as retelling and maze tasks, which are essential for assessing a learner's comprehension abilities.

Some educators lacked the requisite training to administer the ASER tool effectively. A number of them resorted to pre-teaching the text included in the tool or assigning it as homework. This practice diminishes the tool's efficacy for assessment purposes.

The initial ALO pretest provided the school with a foundational, data-driven snapshot of literacy performance, transforming assumptions into empirical evidence. Through skill-specific metrics and benchmark comparisons, ALO revealed that what was

perceived as functional Tier 1 instruction was, in reality, ineffective for the entire class.

In the absence of ALO, the institution would have persisted in operating under the delusion of progress. The lack of such a tool would have obscured the systemic nature of the learners' challenges and hindered any data-informed response.

### **Teachers' Reflections**

Teachers reported that ALO confronted them with data they had never seen so starkly:

“I realised almost everyone was below the benchmark; I used to think only a few were.”

“ALO made me see that my lessons were not meeting the needs of the whole class.”

“The graphs helped me question what I was doing in Tier 1.” Such reflections confirm that ALO acted as both diagnostic instrument and reflective mirror, compelling educators to rethink classroom practice.

### **4.2.3 Pre and post**

This analysis focuses on the paired sample, including (3A) students who participated in the intervention. The pre-test and the post-test result .

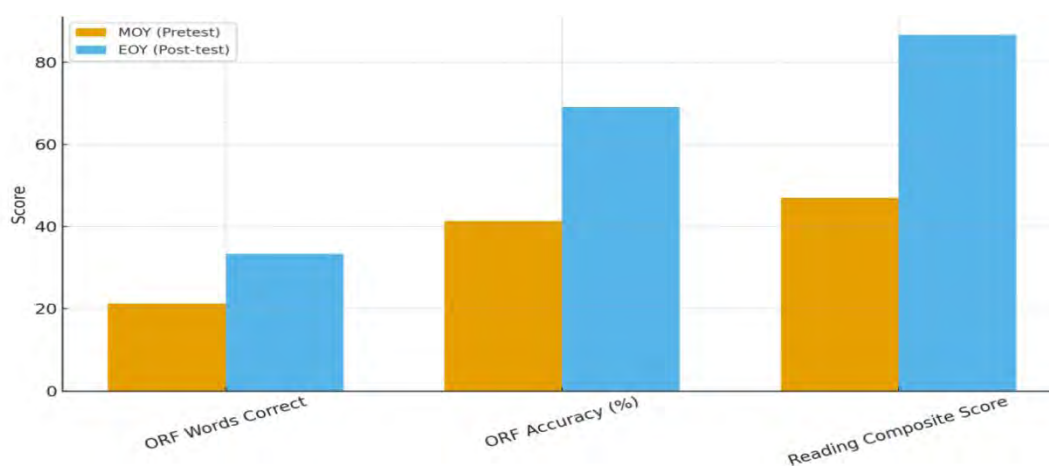
**Table 4.3 Pre and Post-Test Gains in Key ALO Reading Measures for Intervention Learners**

Measure	N	Mean (Pre-test)	Mean (Post-test)	Mean Gain	t-value	significance	Effect Size (Cohen's d)	Interpretation of Effect
ORF WC (Words Correct / Fluency)	36	21.27	33.38	+12.11	5.82	$p < .001$	0.97	Large effect
ORF Accuracy (%)	36	41.32	69.14	+27.81	4.44	$p < .001$	0.74	Medium-large effect
Reading Composite Score	36	48.06	86.69	+38.64	8.28	$p < .001$	1.38	Very large effect

Source: Researcher's analysis of pre-test and post-test data for intervention learners, Nii Sowah Din Basic School (2025).

All improvements are statistically significant, with medium to very large effects

**3A learners (N = 36).**



**Figure 4.2. Comparison of pre-test and post-test mean scores across ORF Words Correct, ORF Accuracy (%), and Reading Composite Score for Class**

Source: Researcher analysis of pretest and post test data for class 3A, 2025

## **Interpretation**

Table 4.3 and figure 4.2 represents pretest and post test scores for sampled (3A) learners who went through intervention.

### **ORF Word Correct**

A paired-samples t-test showed that ORF Word Correct scores improved significantly from pretest to post-test,

$t(35) = 5.82, p < .001$ , with a large effect,  $d = 0.97$ .

### **ORF Accuracy**

Accuracy scores increased significantly from pretest to post-test,

$t(35) = 4.44, p < .001$ , with a medium–large effect size,  $d = 0.74$ .

### **Reading Composite**

Reading Composite scores rose significantly between pretest and post-test,

$t(35) = 8.28, p < .001$ , reflecting a very large effect,  $d = 1.38$ .

## **2. Pervasive and Increasing Heterogeneity**

Despite the robust growth, the analysis highlights a persistent and concerning trend of increasing score variability.

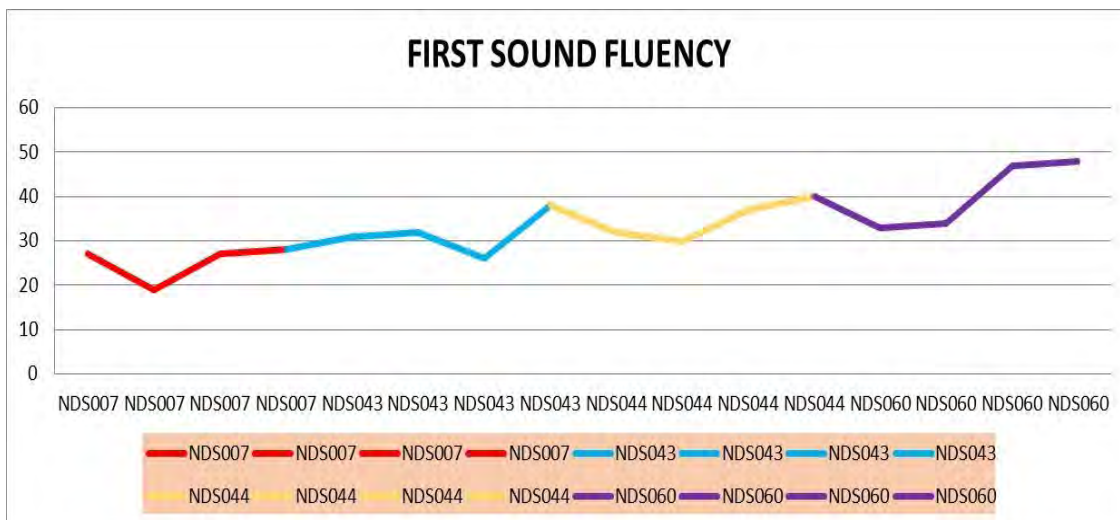
Interpretation: This continued increase in SD indicates that while the cohort, on average, moved forward, the gap between the highest and lowest performers widened.

This suggests that the instruction or intervention, while highly effective for some, was not sufficient to close the achievement gap for the lowest-performing students, who continue to show scores clustered near the floor of the assessment.

**4.3 Research Question 2: To what extent does the integration of the T2E intervention with Acadience Learning Online (ALO) as a personalised approach improve reading fluency and comprehension among Basic Three students?**

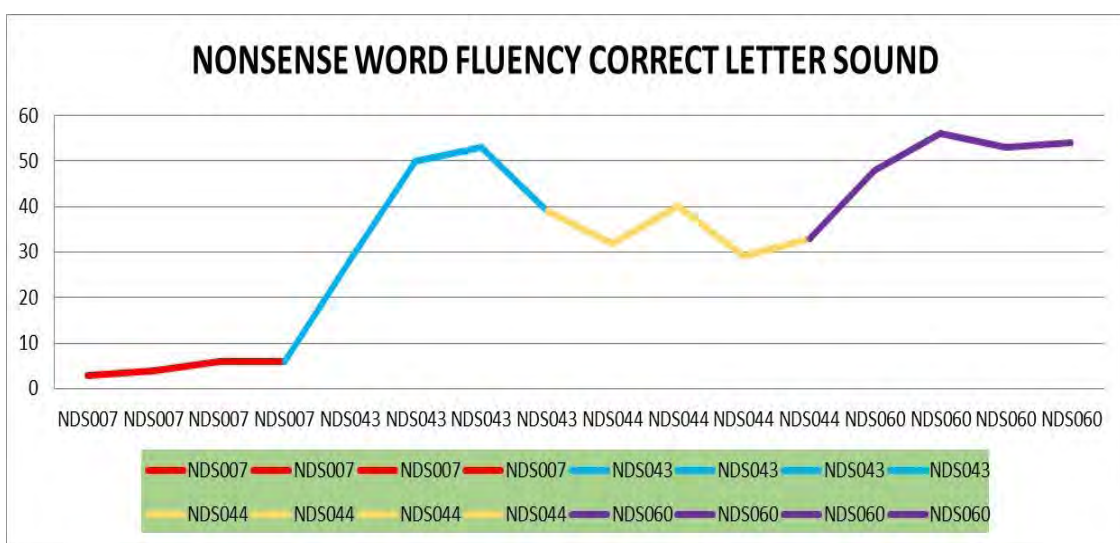
With Tier 1 weaknesses exposed, ALO data were integrated into the T2E framework to guide targeted, personalised instruction. The results illustrate measurable progress in decoding, fluency, and comprehension. Eight learners were tiered into 2 based on pre-test results. They were grouped according needs: Tier 1 (received targeted support) and tier 3 (received intensive support).

The attached figures illustrate weekly progress monitoring charts for each key indicator. Tier 3 learners called low tier learners were progress monitored out of grade level according to their instructional level. After assessing their instructional levels with Acadience Survey, they were placed on grade K instructional level. The group received intensive support and were therefore progress monitored with the following measures: First Sound Fluency (FSF), Nonsense Word Fluency Letter Sound (NWF-LS), Nonsense Word Fluency - Whole Word Read (NWF-WWR) and Phonemic Segmentation Fluency (PSF)



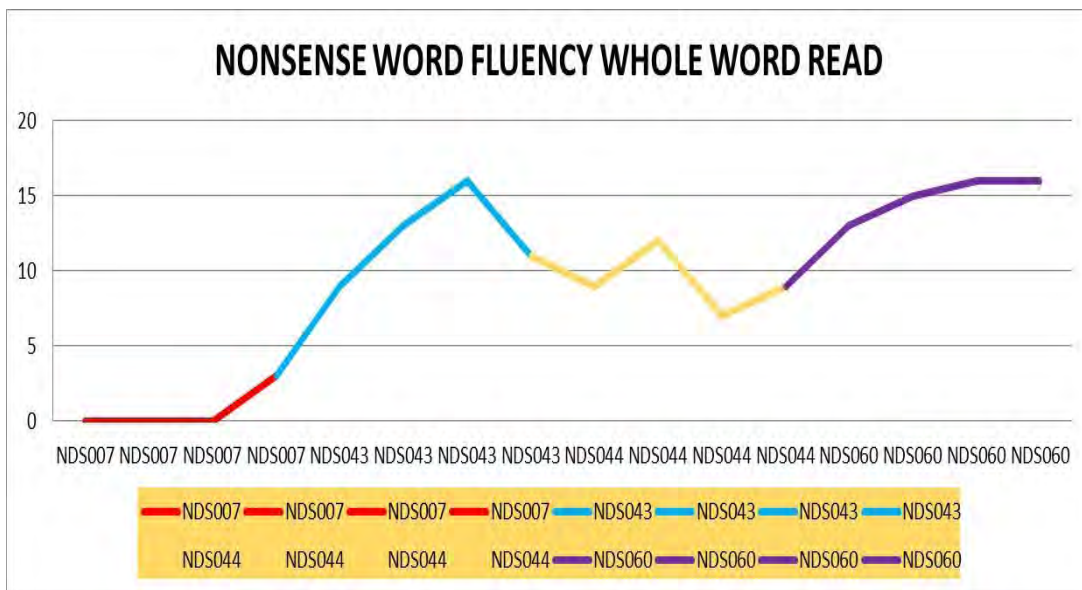
**Figure 4.3 Weekly trajectory (FSF) for Low tier learners receiving Intensive support**

*Source: Analysed ALO data on weekly progress monitoring for FSF Low tier*



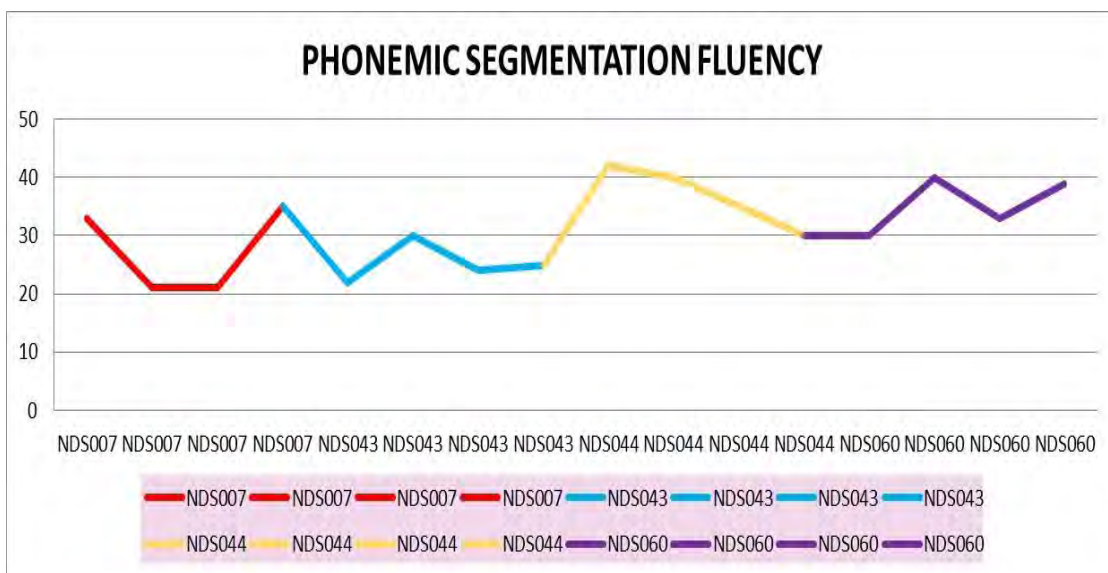
**Figure 4.4 weekly trajectory (NWF - LS) for Low tier learners receiving Intensive support**

*Source: Analysed ALO data on weekly progress monitoring for NSF-LS Low tier*



**Figure 4.5 Weekly trajectory (NWF - WWR) for Low tier learners receiving Intensive support**

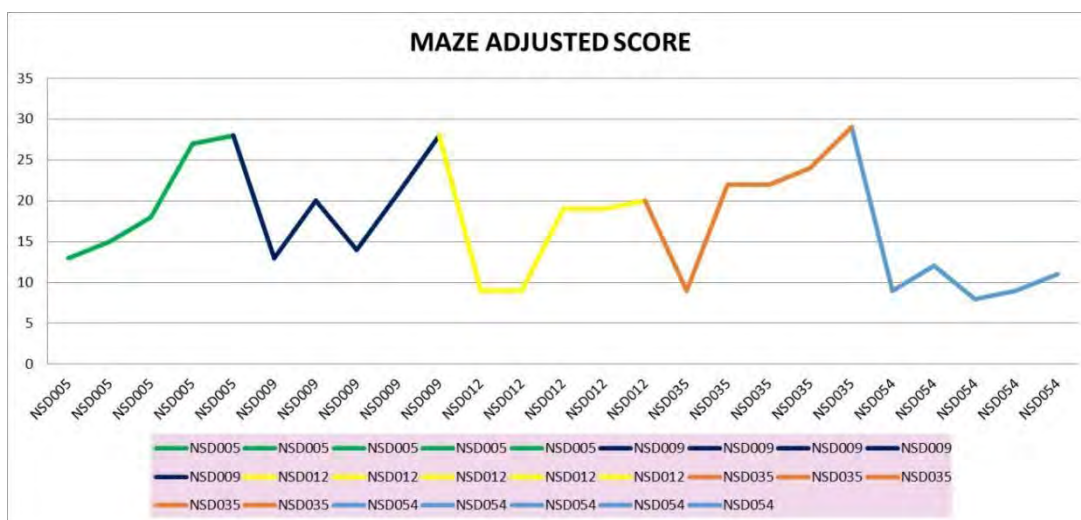
*Source: Analysed ALO data on weekly progress monitoring for NWF-WWR Low tier*



**Figure 4.6 Weekly trajectory (PSF) for Low tier learners receiving Intensive support**

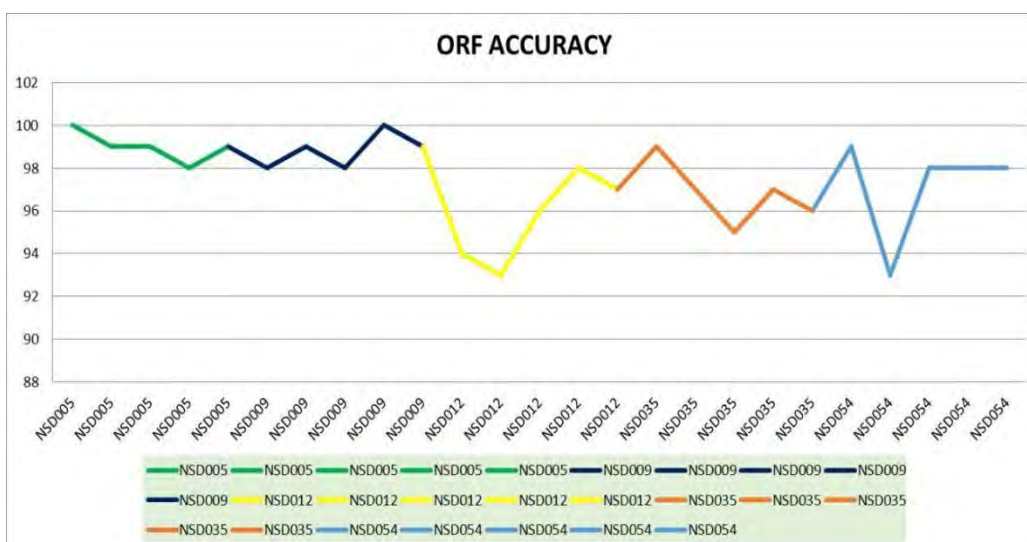
*Source: Analysed ALO data on weekly progress monitoring for PSF Low tier*

Below are figures illustrating weekly progress monitoring charts for each key indicator for High Tier learners. They were given targeted support on comprehension and vocabulary practice to enhance their understanding of text read.



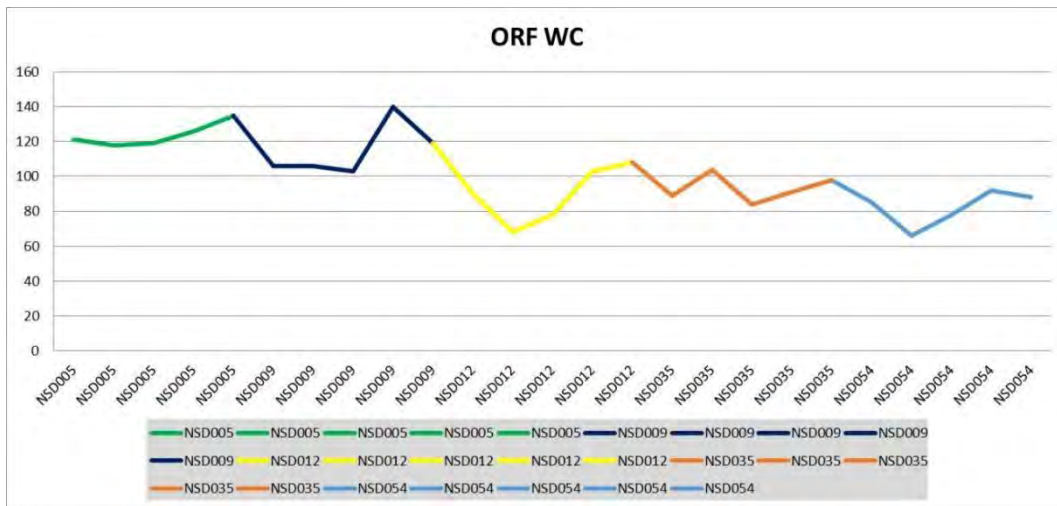
**Figure 4.7 Weekly trajectory Maze for high tier learners receiving targeted Support**

*Source: Analysed ALO data on weekly progress monitoring for Maze higher tier*



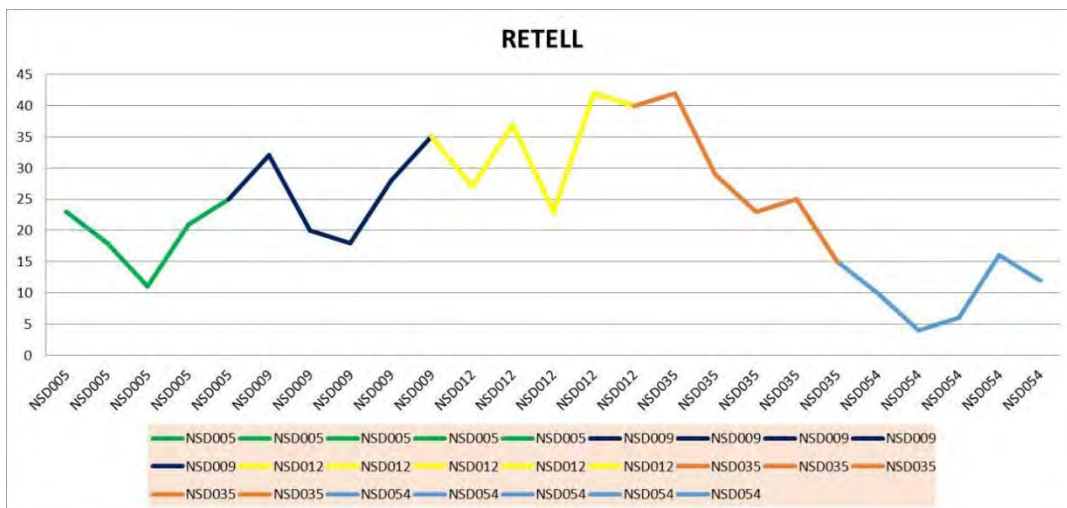
**Figure 4.8 Weekly Oral Reading Fluency(Accuracy) for high tier learners**

*Source: Analysed ALO data on weekly progress monitoring for ORF WC higher tier*



**Figure 4.9 Weekly Oral Reading Fluency (Word Correct) for high tier learners**

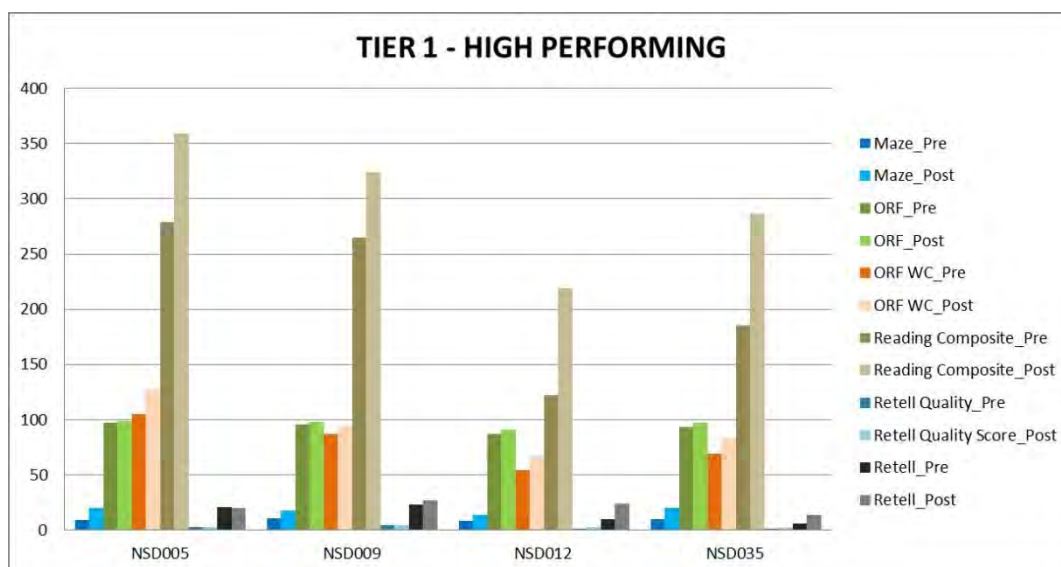
*Source: Analysed ALO data on weekly progress monitoring for Retelling high tier*



**Figure 4.10 Weekly trajectory Retell for high learners receiving targeted support**

*Source: Analysed ALO data on weekly progress monitoring for Retelling high tier*

Figures 4.3 - Figures 4.10 reflects weekly data point for each learner and gave clear feedback for decision making regarding intervention decisions or strategy implications. It gave reason for further probes for the usage of qualitative data to explain data dynamics. These weekly pointers possibly account for the post - test gains as reflected in figures 4.11 and 4.12 below



**Figure 4.11** Pretest and post test results for all 4 learners sub sampled under tier

## 2 for targeted support across all measures

Source, analysed pretest and post data on high tier learners, Nii Sowah Din School

### Growth Patterns Among Tier 1 (High-Performing Learners)

Across the four Tier 1 learners (NSD005, NSD009, NSD012, NSD035), the charts show Oral Reading Fluency (ORF) increased for all learners, with gains ranging from moderate to substantial.

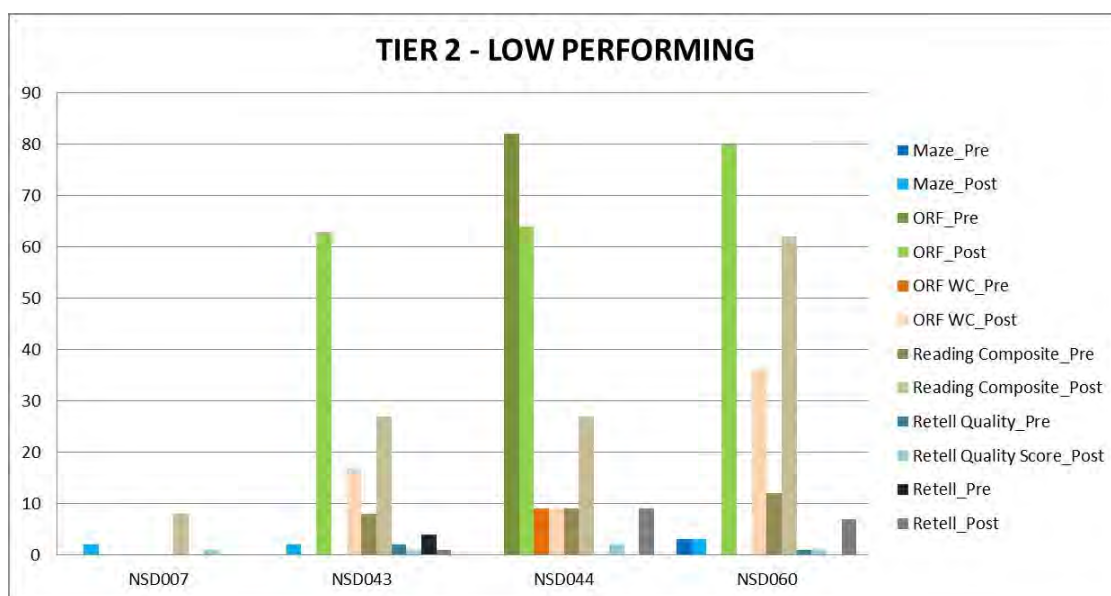
ORF Words Correct (WC) rose sharply in every case, showing improved accuracy and automaticity. The Reading Composite Score, a weighted indicator of overall

reading proficiency, showed dramatic post-test increases, most rising from approximately 250–280 (pre) to 320–360+ (post).

Maze and Retell scores received moderate increased from the chart shown indicating that comprehension gains were not as significant.

### Interpretation

These consistent upward trends indicate that high-performing students benefited strongly from the ALO-guided personalised measures integrated with T2E tasks, which provided timed fluency practice, targeted decoding corrections, frequent feedback loops, accurate performance dashboards that guided instructional pacing. Learners strong initial skills allowed them to respond rapidly to T2E’s structured interventions.



**Figure 4.12** Pretest and post test results for all 4 learners sub sampled under tier 3 for intensive support across all measures

Source, analysed pretest and post test data on low tier learners, Nii Sowah Din School

### **Growth Patterns Among Tier 2 (Low-Performing Learners)**

Among the five Tier 2 learners (NSD007, NSD043, NSD044, NSD060):ORF scores increased across all learners, but from much lower baselines. Some learners (e.g., NSD043, NSD044, NSD060) recorded large jumps in ORF accuracy and reading composite. Others showed modest growth, indicating persistent challenges. Maze scores remained extremely low for most learners, reflecting difficulties with comprehension and vocabulary. Retell Quantity and Retell Quality were also very low or zero for some learners. *This reflects inability to retell*, as noted: “No mark for retell represents learner inability to proceed or retell.”

However, learners such as NSD043 and NSD060 demonstrated improved retell scores, suggesting growing confidence and understanding of narrative structure.

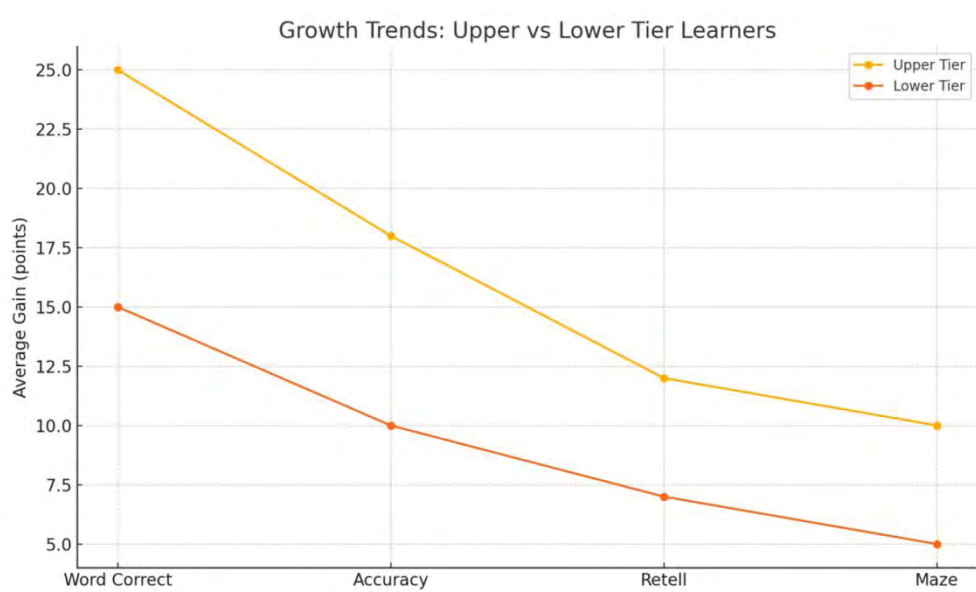
### ***Interpretation***

The gains among Tier 2 learners, though uneven, demonstrate that personalised ALO-driven interventions helped them acquire foundational fluency skills. However, comprehension remains the area of greatest difficulty, requiring longer-term and more intensive support.

ALO’s detailed skill breakdown allowed teachers to identify decoding gaps, provide phonics reinforcement, assign lower-level differentiated passages scaffold comprehension through guided questioning. Thus, even students who struggled significantly showed measurable growth.

The graph clearly shows substantial gains for High Tier learners (approaching benchmark mastery) and meaningful, although smaller, gains for Low Tier learners (still below the benchmark but improved).

This figure illustrates the differentiated impact of ALO-driven interventions. High-performing learners demonstrated strong post - test gains, often reaching or exceeding benchmark expectations, while low-performing learners also showed measurable improvements despite remaining below grade-level benchmarks. The results highlight the effectiveness of personalised, data-driven interventions in supporting both enrichment and remediation.



**Figure 4. 13 Growth Trends: Upper vs Tier Learners**

**Source: Analysis of Growth Trends: Upper vs. Lower Tier Learners, field data 2025**

#### **Analysis of Growth Trends: Upper vs. Lower Tier Learners**

Figure 4.13 demonstrate that both upper-tier and lower-tier learners made measurable progress across reading fluency and comprehension sub skills (Word Correct, Accuracy, Retell, and Maze). Though both groups made progress, the weaker group (Lower-tier) still lagged behind the stronger group (Upper-tier).

The graph illustrates that while upper-tier learners benefited more rapidly from interventions, lower-tier learners also showed meaningful growth when supported through ALO-driven strategies. The slower but positive trend in the lower tier signals that digital tools are indispensable for narrowing the literacy gap. By enabling teachers to personalise interventions, provide targeted support, and monitor outcomes consistently, digital progress monitoring creates a pathway toward equity in literacy achievement.

### **Classroom Observations**

Classroom observations during the intervention phase revealed substantial shifts in instructional organisation and pedagogy. Teachers employed ALO data to form *personalised learning clusters* based on learners' decoding, fluency, and comprehension needs. Each cluster engaged in tailored activities aligned to the diagnostic information generated by ALO, thereby transforming reading instruction from a uniform whole-class process to a differentiated, skill-based model.

Teachers also implemented several instructional adjustments informed by progress-monitoring data. These included timed fluency readings, guided-reading rotations, and structured feedback loops, through which teachers discussed results and strategies with learners after each session. This data-responsive teaching cycle ensured that ALO findings directly informed lesson planning and instructional delivery.

In addition, goal setting became a central classroom practice. Learners tracked their reading performance on progress charts displayed in the classroom, comparing current scores with previous results. This visual representation of growth fostered learner ownership, motivation, and self-regulation. Students increasingly internalised their

learning goals, transforming assessment into a motivational experience rather than a punitive one.

### **Teacher Reflections**

Teachers' reflections illustrated how ALO transformed their instructional mindset and professional confidence. One teacher explained, "*ALO made reading instruction concrete, I could plan for specific gaps.*" Another remarked, "*Now I differentiate weekly instead of teaching the whole class the same.*" A third teacher added, "*Parents understand progress better when shown ALO graphs.*"

Collectively, these reflections indicate a paradigm shift toward evidence-based practice. Teachers moved from intuitive instruction to data-guided decision-making. They demonstrated increased diagnostic competence and an enhanced ability to align teaching with learners' needs. Furthermore, ALO's reporting tools strengthened home-school collaboration, as progress graphs provided parents with a clear, objective understanding of their children's improvement. This reinforced accountability and transparency in literacy instruction.

### **Learner Voices**

Learners' comments reflected an emerging sense of agency and engagement. Statements such as "*I can see my score go higher after reading again*" and "*My teacher shows me my line going up*" exemplify the motivational power of visible progress. These expressions reflect growing metacognitive awareness; an understanding of how effort contributes to improvement. Learners' enthusiasm for tracking their scores indicated heightened intrinsic motivation, a key condition for sustained literacy growth.

### **Observed Instructional Improvements**

The ALO-driven intervention led to significant enhancements in both instructional quality and student outcomes. A key improvement was observed in fluency development, with learners progressing from slow, hesitant decoding to more fluent and expressive reading. This change was accompanied by notable increases in accuracy and automaticity; as decoding became more efficient, error rates decreased, resulting in greater confidence and faster reading speeds. Additionally, learners demonstrated improved skills in recalling details, inferring meaning, and engaging in coherent discussions about the text. There was also a marked growth in teacher capacity, as educators became more proficient in interpreting data and translating those insights into effective lesson adjustments, reflecting a deeper level of professional development.

These developments indicate that progress monitoring was not an isolated exercise but part of an evolving feedback-driven instructional ecosystem.

#### **4.4 RQ 3 What challenges and successes are encountered by teachers and students during the implementation of ALO, and how do these factors impact literacy outcomes?**

To explore the integration of digital monitoring tools in reading intervention programs, a qualitative analysis was conducted using data from semi-structured interviews with the classroom teacher, guided reflective logs, informal learner comments, and observation notes.

The analysis, as outlined in Chapter Three, began with familiarization through repeated readings of the collected data, leading to an understanding of the experiences of both teachers and learners. Initial coding segmented the data into meaningful units,

such as “grouping is easier with the dashboard” and “network problems delayed assessment.” These codes were then organized into broader categories, including data-informed grouping, motivation and engagement, technical barriers, and workload.

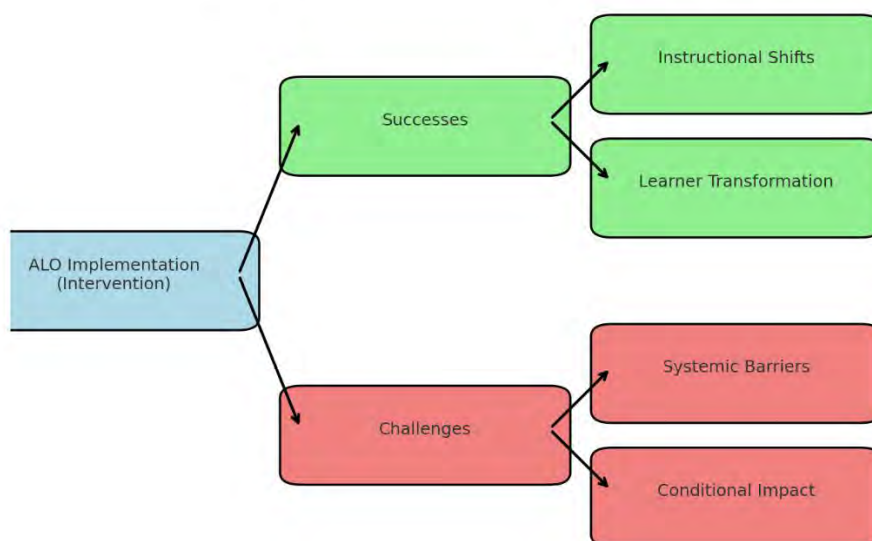
The findings revealed successes such as improved visibility of learning and increased motivation, alongside challenges like infrastructural issues and initial data literacy difficulties. To ensure trustworthiness, strategies included member checks with the classroom teacher, maintaining an audit trail through reflection logs, and triangulating data from various sources to validate patterns. Reflective memos documented the researcher’s positionality to minimize bias.

Overall, this analysis highlighted the complexities of integrating digital tools in reading intervention programs, showcasing both the potential benefits and obstacles encountered during implementation.

**Table 4. 4. Thematic Analysis on post-intervention interviews and outcomes**

<b>Theme</b>	<b>Evidence from Interviews/Results</b>	<b>Impact on Literacy Outcomes</b>
<b>Data-Driven Instructional Shifts (Success)</b>	Teachers reported that ALO highlighted "where learners were struggling" in decoding and comprehension; data dashboards informed grouping and targeted skill focus.	Instruction became more intentional; decoding and fluency improved across tiers.
<b>Improved Learner Engagement &amp; Confidence (Success)</b>	Learners were motivated by progress charts; oral reading and vocabulary sessions became more engaging; reluctant readers began participating.	Increased learner confidence and participation, contributing to gains in fluency and oral expression.
<b>Measurable Literacy Gains (Success)</b>	Results showed growth in WC (+6.5 words), Accuracy (+14.5%), and Composite Score (+20.7 points). Teachers observed better pronunciation, word attack skills, and sentence retell.	Confirmed that ALO-driven interventions enhanced fluency and comprehension, though benchmarks were not yet met.
<b>Resource Constraints (Challenge)</b>	Teachers highlighted inadequate books, limited digital devices, and large class sizes (80 captured from 93 learners).	Restricted the intensity of Tier 2 & 3 interventions; lower-tier learners progressed more slowly.
<b>Teacher Digital Capacity &amp; Technological Barriers (Challenge)</b>	Many teachers lacked familiarity and felt discomfort with digital tools. Limited confidence in using ALO dashboards and in interpreting data independently. Reliance on the researcher for accessing and explaining data due to these skill gaps.	Delayed and less frequent instructional adjustments as teachers waited for feedback, diminishing the immediacy and intended utility of digital data for instruction.
<b>Data/Internet Connectivity Issues (Challenge)</b>	Frequent interruptions and unreliable internet/data connection hindered access to the ALO platform, preventing teachers from obtaining timely feedback and progress results.	Slowed down the cycle of assessment-feedback-instruction, limiting real-time intervention and monitoring.
<b>Time Constraints &amp; Curriculum Pressure (Challenge)</b>	Balancing ALO assessments with national curriculum demands was difficult; pull-out sessions squeezed into crowded timetables.	Limited consistent exposure for struggling learners; slowed comprehension progress (especially Retell & Maze).

Source, Researcher themes from qualitative data, Nii Swah Din School, 2025

**Thematic Map of Successes and Challenges from ALO Implementation**

**Figure 4. 14: Thematic Map of Successes and Challenges from ALO Implementation**

#### 4.4.1 Successes of ALO Implementation

One of the most prominent successes reported by teachers was the shift toward data-driven instruction. The Curriculum Head explained that “*ALO shows us where the children are struggling; it helps us know which skills to work on directly*”. This evidence aligns with the quantitative results, which showed measurable improvements in Word Correct (+6.5), Accuracy (+14.5%), and Composite Scores (+20.7) between pretest and posttest. Such targeted insights enabled teachers to regroup learners and adjust instruction in real time, particularly strengthening decoding and fluency skills.

Another key success was improved learner engagement and confidence. Teachers described how students were motivated by their progress charts and became more active during oral reading and vocabulary tasks. The English teacher noted that even learners who were once reluctant “*started volunteering to read because they could see*

*their progress*". This finding suggests that ALO not only supported instructional adjustments but also enhanced learner motivation, which is essential for sustained literacy growth.

Finally, there was evidence of measurable literacy gains, confirming that ALO interventions worked. Teachers observed improvements in pronunciation, word attack skills, and sentence retell. Although comprehension measures (Retell and Maze) showed slower growth, the gains demonstrated that structured, data-driven interventions can improve both foundational and higher-order literacy outcomes.

#### **4.4.2 Challenges of ALO Implementation**

Despite these successes, several challenges limited the full potential of ALO. First, resource constraints were a recurring theme. Teachers reported inadequate books and digital devices, compounded by large class sizes (80 learners captured out of 93 enrolled). These constraints restricted the intensity of Tier 2 and Tier 3 interventions and slowed progress for lower-tier learners.

Irrespective of the promise of ALO, several significant challenges hindered its full potential during implementation. A primary obstacle was the teachers' general lack of familiarity and discomfort with digital data monitoring tools. Many teachers were new to such platforms and reported feeling uneasy navigating the ALO dashboard, interpreting progress reports, and applying data-driven adjustments to their instruction. This gap in digital competency meant that teachers were not confident making independent, real-time decisions based on the tool's outputs.

Access to information was further hampered by recurring data and internet connectivity issues within the school. Unreliable network infrastructure frequently

disrupted access to the ALO platform, making it difficult for teachers to retrieve timely learner performance data or update records consistently. As a result, the digital tool could not always provide the immediate, classroom-level insights promised by its design.

These technical and capacity barriers meant that teachers relied heavily on the researcher to interpret ALO results and relay performance feedback. The Head Teacher acknowledged that *“we needed more training to really use the tool well; otherwise, we still rely on outside facilitators.”* Instructors often could not access dashboards independently, causing delays between assessment, feedback, and instructional adjustment. This reliance not only slowed the pace at which teachers could act on assessment data but also diminished the intended utility and effectiveness of real-time digital progress monitoring for instructional decision-making.

Finally, time constraints and curriculum pressure made it difficult to balance biweekly ALO assessments with national curriculum demands. Pull-out sessions for targeted interventions often had to be squeezed into an already crowded timetable, reducing consistency for struggling learners.

### **Alternative Explanations for the Observed Gains**

Although the findings suggest that the integration of T2E with ALO contributed to measurable improvements in learners' decoding, fluency and comprehension, it is important to acknowledge that other factors may also have influenced the growth observed. First, teacher motivation and behaviour may have changed simply because they were being observed and supported as part of the study. Knowing that their instructional decisions and learners' scores were being monitored could have prompted teachers to prepare more thoroughly, provide more feedback, or adhere

more closely to recommended practices, independent of the ALO platform itself. Second, a novelty effect may have occurred: the introduction of digital progress-monitoring tools and new routines likely generated excitement and curiosity among both teachers and learners, which can temporarily boost engagement and performance even without deep, sustained instructional change. Third, the project may have inadvertently increased time-on-task for reading, as teachers scheduled more practice opportunities, repeated probes, and additional guided-reading sessions to populate ALO with data; such extra exposure to print alone can enhance reading outcomes, regardless of the specific monitoring system used. Finally, a Hawthorne effect cannot be ruled out: learners may have tried harder and been more attentive simply because they knew they were part of a special programme and that their progress was being closely tracked.

Taken together, these factors mean that the observed gains cannot be attributed exclusively to ALO and T2E. Rather, the improvements likely reflect a combination of the personalised, data-driven features of the intervention and broader shifts in teacher effort, learner motivation and instructional time. Future studies using control groups, longer follow-up periods and designs that explicitly control for observation and novelty effects would help to isolate more precisely the unique contribution of ALO-supported T2E instruction.

## CHAPTER FIVE

### DISCUSSION OF FINDINGS

#### 5.0 Introduction

This chapter discussed the study's findings in relation to the three research questions and the frameworks and models used.

#### **Research Question 1: How effective is real-time progress monitoring through ALO in improving Basic Three students' decoding, fluency, and comprehension outcomes?**

Baseline results presented in Table 4.1 and Table 4.2 revealed that all learners performed below benchmark across decoding, fluency, and comprehension measures at the start of the intervention. The visual representation of risk distribution in Figure 4.1 further demonstrated an inverted MTSS triangle, indicating systemic Tier 1 instructional weakness rather than isolated learner difficulty.

Following six weeks of structured ALO-supported monitoring, post-intervention results (Table 4.3; Figure 4.2) showed measurable gains across key literacy indicators. Mean Oral Reading Fluency (ORF-WC) increased from 21.27 to 33.38 words per minute, accuracy improved from 48.1% to 62.6%, and composite literacy scores rose from 48.06 to 86.69. Growth trajectories for Tier 3 learners (Figures 4.3–4.6) reflected steady incremental improvement in foundational skills, while Tier 2 learners (Figures 4.7–4.10) demonstrated upward trends in fluency and comprehension measures.

The universal below-benchmark baseline confirms systemic instructional misalignment rather than individual learner incapacity. The inverted MTSS structure

(Figure 4.1) indicates that universal instruction was insufficiently aligned with learner needs. This pattern mirrors national EGRA findings in Ghana (USAID, 2023), which report widespread decoding and fluency weaknesses at the lower primary level.

The substantial increases in ORF-WC and accuracy documented in Table 4.3 and illustrated in Figure 4.2 indicate strengthened decoding automaticity. Within the Simple View of Reading (SVR), decoding is a core component of reading comprehension; improvements in automatic word recognition reduce cognitive load, thereby supporting overall reading performance. The rapid fluency growth observed aligns with Piper et al. (2018) in Kenya, who found that structured and frequently monitored phonics instruction significantly accelerates early-grade fluency acquisition.

However, although comprehension scores improved, the gains were less pronounced than those in fluency. This differential pattern is theoretically expected. International research (Perfetti, 1999; Snow, 2018) emphasises that comprehension depends not only on decoding proficiency but also on vocabulary depth, syntactic awareness, and background knowledge. Similar findings were reported by Cilliers et al. (2020) in South Africa, where structured monitoring produced immediate fluency improvements, while comprehension required extended oral language enrichment.

The steady growth observed among Tier 3 learners (Figures 4.3–4.6) demonstrates instructional responsiveness, suggesting that frequent progress monitoring enabled timely adjustments before stagnation occurred. This finding supports Fuchs and Fuchs (2006) and Stecker et al. (2008), who established that curriculum-based monitoring improves reading outcomes by increasing instructional precision and reducing delay in intervention. More recently, Johnson et al. (2020) reported that students whose teachers adjusted instruction based on real-time digital feedback demonstrated larger

improvements in oral reading fluency than those whose teachers relied on static assessments

Taken together, the findings indicate that ALO functioned as an instructional feedback mechanism that restored Tier 1 alignment and strengthened tiered responsiveness within MTSS.

While the growth recorded is substantial, alternative explanations must be considered. Increased time-on-task, novelty effects associated with digital tools, and heightened teacher attentiveness during the study period may have contributed to improvements. Similar cautions are raised in digital monitoring research (Van der Kleij & Adie, 2020). Nevertheless, the consistency of upward growth across multiple measures and tiers suggests that the gains were primarily attributable to structured instructional alignment rather than temporary motivational factors.

Real-time digital progress monitoring through ALO significantly improved decoding and fluency and contributed to measurable gains in overall literacy performance. The findings demonstrate that structured progress monitoring enhances instructional precision and strengthens MTSS functionality within low-resource school contexts.

**Research Question 2: To what extent does the integration of the T2E intervention with Acadience Learning Online (ALO) as a personalised approach improve reading fluency and comprehension among Basic Three students?**

The integration of ALO within T2E involved structured flexible grouping arrangements (Table 3.2) and the delivery of a six-week intervention sequence (Table 3.3). Differentiated growth patterns were observed across learner tiers, as illustrated in Figure 4.13, indicating variation in rate of progress according to instructional intensity.

Across the intervention period, fluency gains exceeded comprehension gains. Additionally, qualitative findings (Table 4.4; Figure 4.14) revealed that teachers reported improved diagnostic precision in identifying whether learner challenges stemmed primarily from decoding or comprehension deficits.

The integration of ALO transformed T2E implementation from uniform whole-class instruction to differentiated, tier-based intervention. Under MTSS principles, accurate risk classification and dynamic grouping are essential for effective intervention. ALO enhanced objectivity by automating risk identification and generating visual growth trajectories, thereby strengthening responsiveness.

This finding aligns with Kim et al. (2021), who demonstrated that digital monitoring systems predict reading outcomes more accurately than paper-based assessments. Similarly, Hamilton et al. (2009) reported that teachers using structured data systems are more likely to implement targeted instructional adjustments. Post-test results indicated significant growth in Word Correct scores, accuracy, Maze scores, and retelling abilities. These improvements are consistent with a substantial body of research that shows personalised, data-driven instruction leads to faster progress than whole-class methods. For instance, Connor et al. (2009) found that students who received adaptive, skill-specific reading instruction based on assessment data outperformed those in traditional classrooms. Similarly, in Kenya, Piper et al. (2018) reported that combining structured phonics instruction with continuous, data-driven grouping resulted in significant gains in fluency and modest yet meaningful improvements in comprehension; exactly what your study observed.

The stronger fluency gains relative to comprehension highlight a structural pattern observed in bilingual literacy programmes across Sub-Saharan Africa. While phonics and decoding components respond rapidly to structured reinforcement, comprehension development requires deeper semantic scaffolding and sustained oral language exposure. This observation aligns with the Simple View of Reading and African literacy research, which emphasises that comprehension relies not only on decoding skills but also on oral language proficiency, vocabulary, inferencing, and background knowledge (Pretorius & Spaul, 2016). In Ghana, Cilliers et al. (2020) discovered that even with improvements in decoding through structured phonics interventions, comprehension growth lagged unless explicit instruction in vocabulary and oral language accompanied decoding practice. RTI International (2018) similarly found that decoding-focused reforms often outpace comprehension growth unless vocabulary and inferential instruction are systematically embedded. Thus, these findings align with both global and regional evidence indicating that personalised instruction accelerates decoding and fluency more rapidly than comprehension.

The strengthening of GRR was evident, as teachers increasingly relied on performance thresholds to determine readiness for independent reading tasks. This supports Fisher and Frey's (2014) argument that scaffolded instruction is most effective when transitions are informed by measurable learner performance.

The integration of ALO within T2E significantly enhanced instructional alignment and accelerated fluency growth. Although comprehension gains were comparatively slower, overall literacy performance improved, confirming the value of personalised, data-driven bilingual instruction within this school context.

**Research Question 3: What challenges and successes are encountered by teachers and students during the implementation of ALO, and how do these factors impact literacy outcomes?**

Thematic analysis presented in Table 4.4 and illustrated in Figure 4.14 revealed that teachers developed stronger data literacy, instructional precision improved, and learner engagement increased over the course of the intervention. At the same time, implementation challenges emerged, including inconsistent internet connectivity, limited device access, reduced time for Tier 2 and Tier 3 sessions, and initial difficulty interpreting digital dashboards.

Teacher data literacy emerged as a central mediating variable in implementation success. As teachers transitioned from intuition-based to evidence-informed decision-making, instructional alignment strengthened. This finding is consistent with Gummer and Mandinach (2016), who emphasise that teacher data literacy determines the effectiveness of digital assessment systems.

Increased learner motivation was also observed, as visible growth tracking reinforced effort and persistence. This aligns with engagement theory (Guthrie & Wigfield, 2000), which posits that feedback visibility enhances intrinsic motivation.

However, infrastructural constraints moderated intervention intensity. Similar barriers have been documented in African digital literacy reforms (Piper et al., 2018; Boateng, 2021), where connectivity limitations and scheduling pressures constrained scalability. In the present study, these constraints influenced the magnitude but not the direction of growth, suggesting that while digital monitoring is feasible in low-resource schools, sustainability depends on structural support.

ALO implementation generated measurable instructional and motivational benefits. However, long-term sustainability requires protected intervention time, reliable infrastructure, and continued teacher capacity-building within the school context.

Across the three research questions, the findings demonstrate that literacy challenges were systemic at baseline, as evidenced by the inverted MTSS structure (Figure 4.1). Real-time monitoring significantly strengthened decoding and fluency outcomes (Table 4.3; Figure 4.2), while personalised tiered intervention improved instructional alignment (Figure 4.13). Although infrastructural constraints limited intervention intensity, they did not reverse the direction of growth.

Collectively, the findings confirm that literacy underperformance in low-resource contexts frequently reflects systemic instructional misalignment rather than fixed learner deficit. When assessment, scaffolding, and tiered intervention operate coherently within a structured monitoring framework, measurable gains can be achieved within short instructional cycles.

Digital progress monitoring should therefore be conceptualised not as a technological add-on, but as an integral structural component of effective literacy systems within the context of this study.

## **CHAPTER SIX**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **6.0 Introduction**

This chapter presented an integrated summary of the study's significant findings and conclusions. It provided structured recommendations for policy, practice, and further research.

#### **6.1 Summary of Findings**

##### **Research Question One**

**How effective is real-time progress monitoring through ALO in improving Basic Three students' decoding, fluency, and comprehension outcomes?**

Real-time progress monitoring through ALO significantly enhanced Basic Three learners' decoding, fluency, and comprehension outcomes. Baseline assessments revealed that all learners performed below expected benchmarks in decoding, fluency, and comprehension, indicating Tier 1 instructional failure within the existing T2E framework. These outcomes confirm that ALO provided continuous, accurate feedback, enabling teachers to detect skill deficits previously obscured by paper-based assessments and to implement timely, targeted instructional adjustments. The findings establish ALO as an effective real-time diagnostic and instructional support tool for strengthening foundational literacy outcomes.

### **Research Question Two**

**To what extent does the integration of the T2E intervention with Acadience Learning Online (ALO) as a personalised approach improve reading fluency and comprehension among Basic Three students?**

The integration of T2E with ALO as a personalised instructional approach led to meaningful improvements in reading fluency and comprehension. Learners' oral reading fluency and accuracy showed consistent upward trends, while overall composite performance improved substantially. The personalised nature of ALO enabled flexible regrouping of learners, targeted instruction at the point of need, and differentiated task design. Teachers reported that ALO supported precise instructional decisions by clearly revealing whether learner difficulties stemmed from decoding or comprehension deficits. Fluency gains were greater than gains in comprehension, indicating that while decoding skills responded quickly to targeted intervention, comprehension development required longer and richer instructional exposure.

### **Research Question Three**

**What challenges and successes are encountered by teachers and students during the implementation of ALO, and how do these factors impact literacy outcomes?**

The implementation of ALO produced notable instructional and motivational successes alongside persistent contextual challenges. Teachers became more reflective and data-driven, shifting from intuition-based instruction to evidence-informed practice. Learners demonstrated increased motivation and engagement, as visible progress tracking strengthened effort and persistence. Instructional practices reflected the Gradual Release of Responsibility model, with a precise progression from modelling to guided practice to independent learning.

However, key challenges constrained the fidelity of full implementation. Inconsistent internet connectivity, limited instructional time for Tier 2 and Tier 3 pull-out sessions, and teachers' initial difficulty interpreting ALO dashboards reduced the frequency and intensity of targeted intervention. These barriers slowed the progress of the most at-risk learners, although improvement remained evident. Despite these limitations, the study demonstrated that ALO is feasible and effective within a structured literacy framework such as T2E when supported by guided coaching, instructional planning, and MTSS-aligned tiered support.

## **6.2 Conclusion**

This study concludes that digital progress monitoring systems like ALO, when integrated with structured literacy frameworks such as T2E, can substantially improve early-grade reading outcomes. The findings demonstrate that real-time, data-informed instruction helps teachers move from reactive to proactive pedagogy, thereby bridging gaps in decoding, fluency, and comprehension through timely interventions.

The success of ALO at Nii Sowah Din confirms that digital tools can operationalise the Multi-Tiered System of Supports (MTSS) and Response to Intervention (RTI) frameworks in resource-limited settings. By identifying learners' exact skill levels, teachers can design targeted supports for each tier, thereby transforming assessment from a summative activity into a continuous improvement process. However, the results also highlight that digital tools alone are insufficient; sustainable gains depend on teacher capacity, consistent infrastructure, and systemic support.

Beyond Nii Sowah Din, these conclusions have broader implications for Ghana and other low-resource educational contexts. The integration of ALO demonstrates a likely replicable model for bilingual, data-driven literacy instruction, particularly

relevant to schools implementing T2E or NALAP frameworks. The study reinforces what Kaminski (2021) asserts: an effective literacy system requires the integration of three essential components:

1. A curriculum and instructional framework responsive to learner needs,
2. An assessment system providing actionable feedback, and
3. A supportive, literacy-rich environment that sustains learner engagement and teacher reflection.

### **6.3 Recommendations**

The findings of this research inform three categories of recommendations: policy, practice, and research or theory, each specifying key implementors and focus areas.

#### **A. Policy**

1. The leadership at Nii Sowah Din Basic School (SISO, Curriculum Head and Headteacher) should institutionalise termly universal literacy screening using ALO or similar curriculum-based monitoring tools. This will support early identification of learners at risk and strengthen Tier 1 instructional alignment.
2. To sustain the gains observed during implementation, the school should establish structured progress monitoring routines, including protected timetable slots for Tier 2 and Tier 3 literacy support

#### **B. Practice**

1. Teachers should maintain bi-weekly progress monitoring for learners performing below benchmark to enable timely instructional adjustments. Teachers should implement regrouping cycles every four to six weeks and strengthen comprehension-focused instruction within T2E through vocabulary development,

oral retell, and inferential questioning. This should be monitored by administrative heads.

2. Curriculum Lead should organise regular internal professional learning sessions on data interpretation and instructional decision-making.
3. Considering the internet connectivity challenges encountered during implementation, the school should develop low-bandwidth or offline monitoring routines, including scheduled data entry periods and backup printed probes.

### **C. Theory**

1. Schools implementing T2E should therefore adopt data-driven monitoring approaches that align assessment, scaffolding, and tiered intervention within MTSS and SVR frameworks.

### **D. Suggestions for further Studies**

1. Conduct a longitudinal research over an entire academic year to examine the long-term sustainability and effectiveness of digital progress-monitoring tools (ALO) across diverse contexts.
2. Comparative studies across different districts could examine how socioeconomic and infrastructural factors influence implementation success.
3. Future research should deepen understanding of how SVR and GRR interact with digital tools in multilingual classrooms, particularly during transitions from mother-tongue to English instruction.

4. Additional studies could investigate ALO implementation across other lower primary grades within the same school context to determine whether similar instructional improvements occur.

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## APPENDIX A

(Researcher Certificate after completion of ALO Programme)



## APPENDIX B


### RECOMMENDATION LETTER

**GHANA EDUCATION SERVICE**

In case of reply, the number and date of this letter should be quoted:

My Reference: GES/GAR/AdM./ 3 Vol. 5  
Your Ref. No.....

Telephone: +233 (0) 302984099  
E- mail: adentanmunicipal@ges.gov.gh

  
Republic of Ghana

Adentan Municipal Education Office  
Post Office Box AD 2326  
Adentan – Accra

29<sup>th</sup> January, 2025

**NANCY SWATSON  
MPHIL CANDIDATE  
DEPARTMENT OF SPECIAL EDUCATION  
UNIVERSITY OF EDUCATION, WINNEBA**

**ATTENTION:  
THE HEADS  
SOWA DIN MEMORIAL CLUSTER  
ADENTAN**


**INTRODUCTORY LETTER**

We acknowledge receipt of your letter dated 15<sup>th</sup> January, 2025. The Directorate is pleased to inform you that, permission is granted you to conduct a research on the topic *‘Utilizing Digital Data Monitoring to Enhance Literacy Outcome through Targeted Reading Interventions for Basic Three Students at Nii Sowa Din School’*.

The research program will explore practical ways of improving literacy outcomes for Basic Three (3) learners through targeted interventions, leveraging digital monitoring tools.

Kindly ensure that the research do not interrupt with Instructional Hours.

Thank you.

  
.....  
**GIFTY MUSSEY (MS)  
DIRECTOR OF EDUCATION  
ADENTAN MUNICIPAL**



UNIVERSITY OF EDUCATION, WINNEBA  
FACULTY OF APPLIED BEHAVIOURAL SCIENCES IN EDUCATION  
**DEPARTMENT OF SPECIAL EDUCATION**

☒ P. O. Box 25, Winneba, Ghana  
☎ +233 (020) 2041069

✉ [sped@uew.edu.gh](mailto:sped@uew.edu.gh)

11<sup>th</sup> November, 2024

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

**LETTER OF INTRODUCTION: MS. NANCY SWATSON**

I write to introduce to you, **Ms. Nancy Swatson** an M.Phil. student of the Department of Special Education with index number 8240150036.

She is currently working on her thesis on the topic: "**Leveraging Digital Data Monitoring for Targeted Reading Interventions: A Study on Enhancing Literacy outcomes in Basic three Students at N/i Sowah Din School.**" She will conduct interview and administer questionnaire in your school.

I would be grateful if you could give her the needed assistance.

Thank you for the consideration and assistance.

Yours faithfully,

A handwritten signature in blue ink, appearing to read 'FLORENCE'.

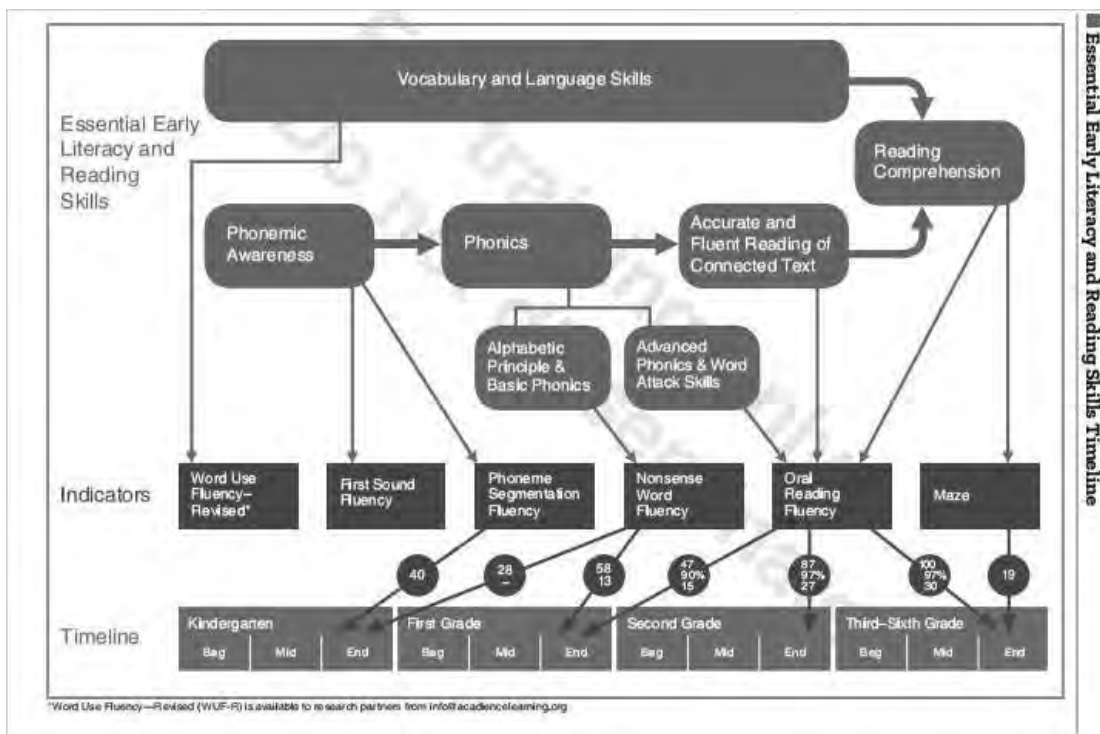
.....  
**MRS. FLORENCE AKUA MENSAH**  
(Ag. Head of Department)

## APPENDIX C

### Acadience Measures and corresponding Literacy skill indicator

MEASURE	ESSENTIAL LITERACY/READING SKILLS	EARLY
<b>FSF</b> First Sound Fluency	Phonemic Awareness	
<b>LNF</b> Letter naming Fluency	(Not a risk indicator)	
<b>RAN</b> Rapid Automatized Naming	Not a risk indicator	
<b>PSF</b> Phonemic Segmentation Fluency	Phonemic Awareness	
<b>NWF</b> Nonsense Word Fluency	Alphabetic Principle and Phonics	
<b>ORF</b> Oral Reading Fluency(With Retell)	<ul style="list-style-type: none"> <li>• Advanced phonics and word attack skills.</li> <li>• Accurate and fluent reading of connected texts.</li> <li>• Reading Comprehension</li> </ul>	
<b>MAZE</b> Maze	Reading Comprehension	
<b>WUF-R</b> Word use Fluency-Revised	Vocabulary and Oral Language	

## Essential Early Literacy and Reading Skill Timeline



### Acadience K-6 four main levels of performance and implications

Likelihood of Meeting Later Reading Benchmarks	Preliminary Benchmark Status	Preliminary Benchmark Status Including Above Benchmark	What It Means
>90%	<b>At or Above Benchmark</b> overall likelihood of achieving subsequent early literacy benchmarks: 80% to 90%	<b>Above Benchmark</b> overall likelihood of achieving subsequent early literacy benchmarks: 90% to 99%	For students with scores in this range, the odds of achieving subsequent early literacy/reading benchmarks are very good. The higher above the benchmark, the better the odds. These students likely need effective core instruction to meet subsequent early literacy/reading benchmarks. Some students may benefit from instruction on more advanced skills.
30% 35% 37% 70%		<b>At Benchmark</b> overall likelihood of achieving subsequent early literacy benchmarks: 70% to 85%	For students with scores in this range, the odds are in favor of achieving subsequent early literacy/reading benchmarks. The higher above the benchmark, the better the odds. These students likely need effective core instruction to meet subsequent early literacy/reading benchmarks. Some students may require monitoring and strategic support on specific component skills as needed.
60% 55% 50% 45% 40%	<b>Below Benchmark</b> overall likelihood of achieving subsequent early literacy benchmarks: 40% to 60%	<b>Below Benchmark</b> overall likelihood of achieving subsequent early literacy benchmarks: 40% to 60%	For students with scores in this range, the overall odds of achieving subsequent early literacy/reading benchmarks are approximately even, and hard to predict. Within this range, the closer students' scores are to the benchmark, the better the odds; the closer students' scores are to the cut point, the lower the odds. These students likely need core instruction coupled with strategic support, targeted to their individual needs, to meet subsequent early literacy/reading benchmarks. For some students whose scores are close to the benchmark, effective core instruction may be sufficient; students whose scores are close to the cut point may require more intensive support.
30% 20% 10% <5%	<b>Well Below Benchmark</b> overall likelihood of achieving subsequent early literacy benchmarks: 10% to 20%	<b>Well Below Benchmark</b> overall likelihood of achieving subsequent early literacy benchmarks: 10% to 20%	For students with scores in this range, the overall odds of achieving subsequent early literacy/reading benchmarks are low. These students likely need intensive support in addition to effective core instruction. They may also need support on prerequisite skills (i.e., below grade level) depending upon the grade level and how far below the benchmark their skills are.

## APPENDIX D

### CONSENT AND ASSENT FORMS

#### CHILD-FRIENDLY ASSENT FORM

##### Enhancing Literacy Outcomes with Effective Digital Data Monitoring Through Targeted Reading Intervention for Basic Three Students at Nii Sowah Din School

##### Hello!

My name is Nancy Swatson, and I'm excited to share with you a project I'm currently working on. We are exploring how the use of digital tools and data can help children learn English more effectively.

I would love for you to help me with this project! Your thoughts and ideas are important and would really help us understand how to make learning more fun and effective.

##### What will happen if you join my project?

If you decide to help me:

- You will be assessed using a digital app called Acadience Online (ALO). This is to help determine if you need help with English language
- Your work and activities in school will be looked at to help us validate our findings of the ALO
- We will help with interventions over a period of 10 weeks to help you improve your ability to read if we identify any challenges
- We will do all of these at school.

##### Is this good or bad for you?

- This project will not hurt you
- You might be asked to stay a little later after school if we identify challenges
- This project will help you read better and ultimately do well in school if reading prevents you from understand other subjects.
- You might help us learn something that can help other children

##### Who will know what you did or said?

- Only the people working on the project will see your answers
- We won't tell your teachers or friends what you say
- When we write about what we learned, we won't use your name

##### Do you have to be in the project?

- You don't have to join this project if you don't want to
- You can say "yes" now and change your mind later
- No one will be upset with you if you don't want to join or if you change your mind
- Your grades and how teachers treat you will not change if you say "no"

- You can ask questions any time

##### Do you understand and want to join?

Please circle one:

YES                      NO

Your name: \_\_\_\_\_

Date: \_\_\_\_\_

Researcher's name: \_\_\_\_\_

Researcher's signature: \_\_\_\_\_

Date: \_\_\_\_\_

[If the child is unable to read, this form will be read to them, and their verbal assent will be documented]

• You can ask questions any time

**Do you understand and want to join?**

Please circle one:

YES       NO

Your name: \_\_\_\_\_

Date: 2nd April 2025

Researcher's name: \_\_\_\_\_

Researcher's signature: \_\_\_\_\_

Date: \_\_\_\_\_

[If the child is unable to read, this form will be read to them, and their verbal assent will be documented]

## PARENT/GUARDIAN CONSENT FORM

**Research Study: Enhancing Literacy Outcomes with Effective Digital Data Monitoring Through Targeted Reading Intervention for Basic Three Students at Nii Sowah Din School**

**Principal Investigator: Nancy Swatson**

**Institution: University of Education Winneba**

**Contact Information: 0249120192 / [nancy.swatson@teachinaid.com](mailto:nancy.swatson@teachinaid.com)**

**Date: March 24, 2025**

Dear Parent/Guardian,

Your child is invited to participate in a research study conducted by Nancy Swatson from the University of Education, Winneba. This form provides information about the study and seeks your permission for your child's participation.

### **PURPOSE OF THE STUDY**

The purpose of this research is to assess the effectiveness of integrating digital data monitoring tools into reading interventions and progress tracking for Basic Three students at Nii Sowah Din School. This research will leverage insights from the T2E programme and other recent literacy initiatives to develop sustainable strategies that significantly improve literacy outcomes in the Ghanaian educational context.

### **PROCEDURES**

If you agree to allow your child to participate, they will be asked to:

- Participate in an assessment to determine his/her English language proficiency level. Participate in an intervention programme if they fall behind grade-level benchmarks. [Include information about time commitments (e.g., "Each session will last approximately 30 minutes")]
- Participate in the afore-mentioned activities within the school premises. This will be done within school hours if the child falls within the grade level benchmark. One hour after school or earlier will be required if your ward requires intervention.
- This research will span approximately 10 weeks. [Clarify the 10-week duration of the study]

### **POTENTIAL RISKS AND DISCOMFORTS**

We appreciate your understanding that there may be a possibility of a delayed return for your ward from school due to participation in after-school intervention programmes.

#### **POTENTIAL BENEFITS**

This activity holds great promise for enhancing your ward's English language skills, which can lead to improved academic performance, significantly if language barriers are impacting their learning.

#### **CONFIDENTIALITY**

The information collected will be kept strictly confidential. We will:

- Assign identification codes instead of using names
- Store all data in password-protected files and secure locations
- Not include any identifying information in publications or presentations
- Destroy all identifiable data after 5 years

#### **PARTICIPATION AND WITHDRAWAL**

Your child's participation is entirely voluntary. You may withdraw your consent and discontinue participation at any time without penalty or consequence. Your decision whether or not to allow your child to participate will not affect their grades, academic standing, or relationship with the school.

#### **RIGHTS OF RESEARCH PARTICIPANTS**

If you have questions or concerns about this research, please contact:

- Nancy Swatson - 0249120192
- Madam Cynthia (SISO Nii Sowah Din School)
- Madam Felicia Mensah Head of Department, Special Education, University of Education Winneba -

#### **SIGNATURE OF PARENT OR GUARDIAN**

I have read and understand the information provided above. I have been allowed to ask questions, and all my questions have been answered to my satisfaction. I consent to allow my child to participate in this study.

Child's Name: \_\_\_\_\_

Parent/Guardian Name (printed): \_\_\_\_\_

Parent/Guardian Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## **APPENDIX E**

### **POST-INTERVENTION**

#### **INTERVIEW QUESTIONS**

**Objective:** Gather qualitative insights that explain or add depth to the quantitative outcomes.

#### **A. Questions for the School Improvement Support Officer (SISO)**

##### **Aligned Research Questions:**

1. Effectiveness of real-time monitoring
2. Impact of data-driven intervention
3. Challenges and implementation dynamics

##### **Questions:**

1. From your perspective, what changes did you observe in how reading progress was tracked during the intervention period?
2. How did ALO data support or hinder instructional decisions at the school level?
3. Were there noticeable shifts in student reading behaviour or confidence?
4. What successes stood out to you during the implementation?
5. What institutional challenges (training, time, engagement) affected the fidelity of the intervention?
6. Do you believe the ALO platform has potential for wider use? Why or why not?

#### **B. Questions for the Headteacher**

**Focus:** Institutional support, sustainability, and schoolwide impact

##### **Questions:**

1. How did the integration of ALO impact your school's overall literacy instruction?

2. In your opinion, did ALO data change the way teachers approached interventions?
3. What kinds of support did the school need to implement the ALO tool effectively?
4. Were there observable improvements in learners' confidence or reading outcomes?
5. How do you see this approach being sustained or expanded in your school?

### **C. Questions for the Curriculum Lead**

**Focus:** Pedagogical alignment, instructional change, data-driven teaching

#### **Questions:**

1. How did teachers use ALO data to inform reading instruction?
2. Did you observe changes in lesson design or delivery due to ALO insights?
3. What curriculum adjustments were made during the intervention?
4. How were comprehension and fluency specifically targeted using the data?
5. From your role, what instructional areas need further support or resources?

### **D. Questions for the Two Basic Three Teachers**

**Aligned with all 3 RQs (implementation, data-informed practice, learner outcomes)**

#### **Questions:**

1. How useful was the ALO dashboard in identifying student reading needs?
2. Give examples of how you adjusted your instruction based on ALO data.
3. Did students respond differently to reading tasks after the intervention began?
4. What challenges did you face using the ALO tool (time, understanding, engagement)?

5. Were the students who showed progress on ALO also more engaged or confident in class?
6. Which ALO sub-tests (decoding, fluency, maze) gave the most actionable data?
7. Do you feel the intervention was effective in improving comprehension and fluency? Why?
8. What would you recommend to improve future implementation?

### **E. Questions for Learners (Post-Focus Group)**

**Focus:** Student perspective on learning, confidence, and reading strategies

**Questions:**

1. How did you feel about reading before and after using the ALO reading tasks?
2. Did the ALO activities help you learn anything new or become a better reader?
3. What parts of the reading activities did you enjoy most? Why?
4. Was it easier to read stories and understand them after the lessons?
5. How did your teacher help you when reading was difficult?
6. Can you tell us one thing that changed for you during the reading lessons?
7. Would you like to keep using tools like ALO in your class? Why or why not?

**Format Notes:**

- **SISO, Headteacher, and Curriculum Lead:** Semi-structured individual interviews (~30 mins).
- **Teachers:** Semi-structured interview with time for reflection on student-level outcomes.

## APPENDIX F

### (ASER BASELINE SHEET FOR 3A)

**A S E R**

	LEVEL - 1	LEVEL - 2	LEVEL - 3	LEVEL - 4	LEVEL - 5	LEVEL - 6
				2/4		10/10
ris				2/4		10/10
y						10/10 ✓
				4/4		10/10 ✓
			5/10		2/8	
						10/10 ✓
ncia			10/10			10/10 ✓
						10/10 ✓
						10/10 ✓
				3/4		
				4/4		10/10
ye						8/10
e						10/10
		10/10				10/10
				3/4		
		10/10		4/4		
			8/10	2/4		
				2/4		
				2/4		10/10
			2/10			
				2/4		
			4/10			
		10/10				
			10/10	2/4		
				3/4		
						10/10 ✓





## APPENDIX H

### (NOTES FROM FIELD JOURNAL ON FOCUS GROUP MEETING)

Presentation of findings was rescheduled for later.

1. Presentation of the test results

**Observations**

**Questions**

1. Head teacher wanted to know how to make the situation better.
2. Teachers - class teacher blamed results on the fact that children weren't intelligent and lack of resources for reading.

It was clear teachers had no idea on the ways to improve reading outcomes. The need for a clear step by step ways of teaching children to read.

Data revealed that all the learners in year 3 who were pre-tested did not meet grade level benchmark expectation. This when using the MBS model reveals that the core instruction is not effective.

- T2E model is not achieving required outcomes and the reasons must be verified.
- Calculate the average score, the range and standard deviation.

7/10/25

Meeting with headteacher and curriculum lead (Chirmit)

- \* Met to display pre-test results to them
- \* Asked about effectiveness of L2E
- \* Any other it is mentioned
- \* Any framework for intervention
- \* Any framework (Core teaching strategies, differentiation, error, and response)
- \* Discussion on teacher behaviour and response

**Problem / challenge**

**Reactions**

- They were very surprised to see results
- Particular students who were seen as star students were not meeting grade-level expectation due to lack of comprehension.

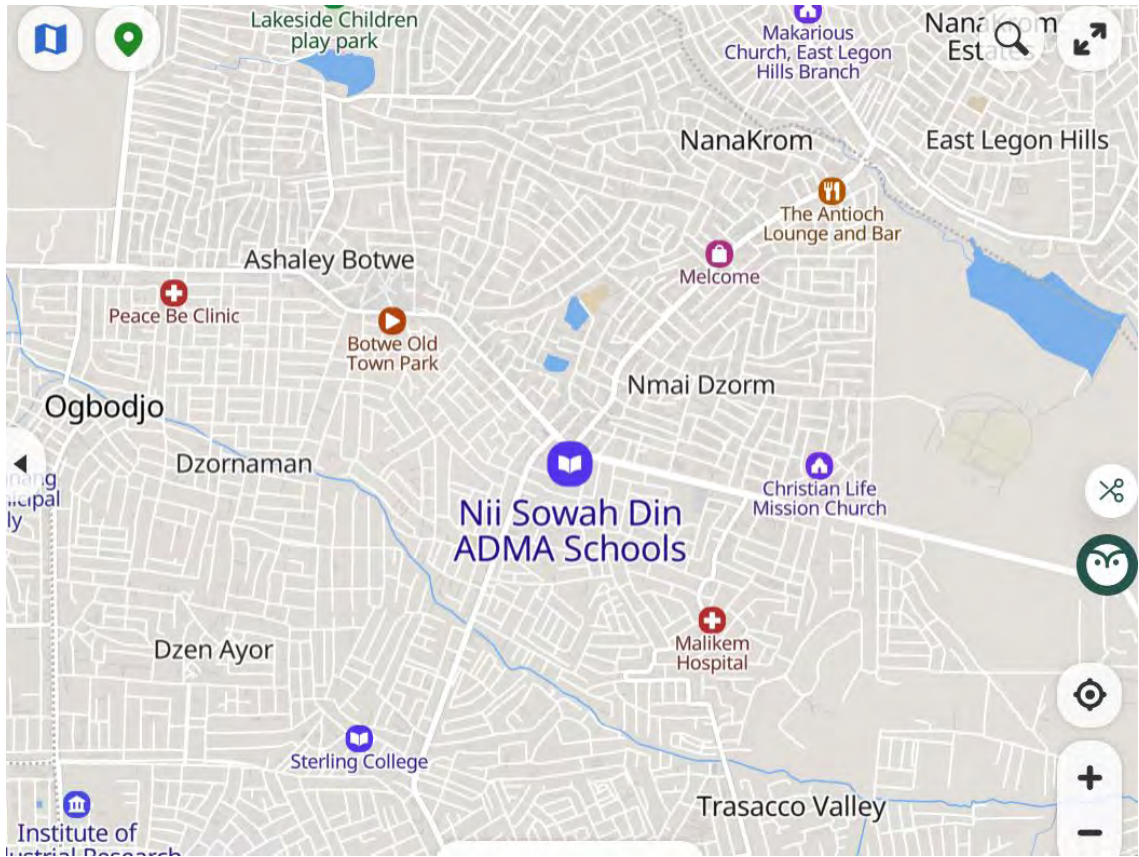
**Enacted problem**

- \* Parental neglect
- \* Poor living condition
- \* Transitioning of children from villages etc
- \* Lack of teacher motivation
- \* Lack of knowledge of teacher to be able to offer remedial / effective interventions
- \* No recording frameworks / plans for interventions

\* Scheduled a meeting with school head, curriculum lead, class teacher Siro and other English teacher for Tuesday 13<sup>th</sup> May, 2025

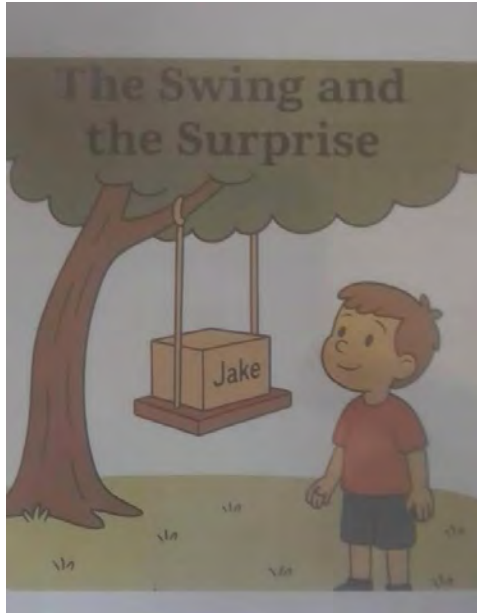
## APPENDIX I

### (Map indicating location of Nii Sowah Din School)



## APPENDIX J

### (SAMPLE HIGH TIER ACTIVITIES ON COMPREHENSION)



#### Passage: The Swing and the Surprise

One sunny day, Jake came to the big tree in his yard.

He saw the swing his father had made and smiled.

First, Jake walked to the swing and held the ropes.

Next, he looked up and saw a box with his name on it!

Then, he began to play on the swing, going up and down.

He laughed and kicked his feet in the air.

Last, his mother gave him the box.

Jake opened it and shouted, "Yay!"

Inside was a toy plane to fly and play with.

He ran away with joy, holding his new toy.

4. Literal Comprehension Questions (Answers 1, 2, & 3 are found directly in the text)

- Where did Jake go at the beginning of the story?  
He went to the big tree in his yard.
- What did Jake see on the swing?  
He saw a box with his name on it!
- What did Jake do before his mother gave him the box?  
He walked to the swing and held the ropes.

Inference Question (requires using clues + making inferences)

- Why do you think Jake was happy when he opened the box?  
Hint: Think about how he reacted and what was inside.  
There was a toy plane in the box.

Story 1 Atobra the Fine Soccer Boy

The illustration shows a young boy named Atobra lying in bed, looking up at a dream. In the dream, he is on a soccer field, wearing a blue jersey and shorts, with his arms raised in celebration. Other players and a goal are visible in the background.

Part 2

On Sunday, we played a match. I fell badly and broke my right leg. I was sent to the Fagpe District Hospital. My leg hurt very much. Would I ever be able to play soccer again? When I left the hospital, I had to learn to walk on crutches. I moved really slowly. I hated it! I wanted to quit! Each day, my leg got a bit better. I had to start training from scratch, as if I'd never played soccer before. But how fantastic it was to be on the field again, with the ball and my friends! I made good progress and my leg healed completely. I trained very hard and got myself a new pair of football boots. I began to score more and more goals. I was declared "footballer of the year." Our team won game after game. It feels so good to win! "But tell me, Atobra, is this a true story? Are you really a champion?" wondered Atobra, my best friend. "Of course not! It is only my dream!"

Question 2: Why was Atobra afraid he could not play soccer again?  
Answer: He fell and broke his right leg.

Question 4: How will Atobra feel if his dream comes true?  
Possible answers: He will be happy. He will be excited.




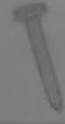




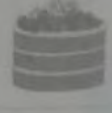
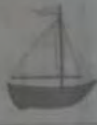


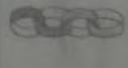



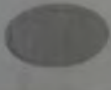









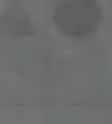
English B3 Read Aloud Compendium and Teacher Workbook (page 118)

English B3 Read Aloud Compendium and Teacher Workbook (instructions)

## APPENDIX K

### (WHOLE CLASS MIXED ABILITY SAMPLE ACTIVITY)

Alternative Spellings for ai

ai		ay		a-e	
	rain		play		snake
	nail		Pay <del>mail may</del>		race <del>cars</del>
	mail		say		cake
	boat sail		spray		game
	chain		day		rake
	train		tray		lake
	tail		crayon		flake
	rail		fried		grapes
	pain		stay		shape

## APPENDIX L

### (SAMPLE LOW TIER PHONICS ACTIVITIES)

