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Digital Pedagogy Tools for Classroom-Based Documentation in Multisensory English Language Learning

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Abstract: Digital technologies are becoming more integrated into the English Language Teaching (ELT) classrooms, but their daily application is still not well represented in empirical studies. This paper will discuss the integration of modest, teacher-mediated digital pedagogy tools into a multisensory ELT curriculum to facilitate the systematic recording of early language learning behaviors. The descriptive design was carried out in a classroom setting in two naturally occurring classrooms with 93 Grade-1 learners. The baseline and post-observation of learner behaviors in the areas of listening, speaking, reading, and writing were recorded in the structured observational rubrics. Digital devices such as audio that is recorded by teachers, projected visual scaffolding, and digitally mediated shared reading displays were integrated into regular teaching to make instructional input more stable and provide a consistent set of conditions of observation. The exploration of measures of central tendency, variability, and distributions of language scores was conducted using descriptive statistics. The results indicated that there were substantial differences between classrooms at the baseline and minimal variations within groups as time passed. Distributions of scores exhibited a tendency towards the rubric's upper end, indicating possible ceiling effects and a potential lack of sensitivity of the measurement approach to short-term changes. These results indicate that teacher-mediated technologies may help the consistency and traceability of classroom-based observations by reducing variance in classroom and observation contexts. The findings point to the need to match the scale of development with measurement sensitivity for more meaningful research in early ELT and the need for more sophisticated observational approaches.

Keywords: Digital Pedagogy; Digital Technologies; Multisensory Instruction; English Language Teaching (ELT); Classroom-Based Assessment; Classroom Documentation; Early Primary Education; Observational Rubrics

1. Introduction

The use of digital technology in early English Language Teaching (ELT) classrooms is on the rise, especially in primary school classrooms where teachers commonly use audio, projected visuals, and digital texts [1,2]. Digital technology is widely embedded in early ELT classrooms; however, empirical evidence on its routine use remains limited. The emphasis in current research is on outcome-oriented, comparative, or highly technology-oriented designs [1,3]. This limits studies on the use of simple digital technology for classroom processes, particularly teaching, assessment, and documentation. Early ELT classrooms pose unique challenges. Testing may be unsuitable given the learners' age, manipulation may affect classroom processes, and child responses may be context-dependent [4,5]. Therefore, observational approaches commonly focus on documenting attention, participation, and language use in natural classroom settings [4,5]. However, limited attention has been given to how digital technologies support

the organization of documentation practices. These are examples of teacher-supported digital interventions rather than stand-alone digital learning environments. As such, they impact classroom processes by changing structure, communication, and observation rather than providing stand-alone teaching interventions [6,7].

The current study contributes to this conversation by documenting how low-tech, teacher-facilitated digital pedagogy tools operate within a multisensory ELT curriculum to enable the documentation of listening, speaking, reading, and writing in Grade 1 classrooms. Adopting a descriptive observational approach, the study focuses on how digitally supported instructional environments enable consistent and ecologically valid classroom-based documentation.

1.1. Digital Technologies in Early ELT Classrooms

Research on digital technologies in English Language Teaching (ELT) has grown significantly over the past two decades and includes the fields of computer-assisted language learning, mobile-assisted learning, and technology-enhanced instruction [2]. Although this literature offers an informative source of information about the advantages of digital technologies, it has rather concentrated on design-oriented research, comparative research, or technology-intensive settings [1]. Consequently, it tends to overlook the realities of early ELT classrooms, where inexpensive and readily available digital technologies are integrated into daily teaching activities. Digital resources often used in primary classrooms are audio recordings to be listened to as part of listening activities, projected visuals to aid collective attention, and digital texts to be used in whole-class teaching. These technologies are incorporated into daily classroom practice and are not presented as individual educational innovations. Although they are widely used, limited attention has been given to their methodological contribution in stabilizing instructional input and assisting with constant observation of learners' behavior [3,6,7].

The frequent use of these tools could lead to a reduction in the inconsistency in the presentation of the tasks, repeated exposure to both visual and auditory stimuli, and the establishment of shared points of reference during engagement with the classroom. These features suggest that there are substantial consequences to the classroom-based recording of learning behaviors, in which cases one should consider the digital technologies in terms of the instructional outcomes as well as their contribution to the stabilization of the classroom processes and systematic observation.

Multisensory teaching has been generally accepted as one of the effective teaching techniques incorporating auditory, visual, and kinesthetic modes of teaching to promote early language acquisition. It is usually applied in primary ELT settings to stimulate learner interest, control attention, and promote understanding [8,9].

Such practices are usually associated with the coordinated functioning of the spoken language, visual representations, physical responses to instructions of the teacher, and collaborative reading activities assisted by visual representations. In addition to pedagogical worth, multisensory teaching also bears a methodological implication for classroom research studies. Multisensory activities tend to be organized, routine, and behavioral, and, as such, are very appropriate in the systematic observation of learners' behavior within a natural classroom setting. By being assisted by digital tools, e.g., replayable input of audio and a visual scaffold projected on the screen, these activities can also stabilize the instructional state further and allow more consistent recording of the learners' behavior between instructional episodes [9].

Multi-sensory teaching in the current research was the pedagogical background under which the digitally based documentation practices were studied. The researchers concentrated on the role of digital tools in normal multisensory teaching to enable systematic observation of the language domains. This pedagogical and methodological duality makes multisensory instruction an efficient setting to analyze how digitally facilitated learning settings provide a stable and dependable platform on which to observe learner behavior. Multisensory ELT classrooms have multimodal interactions that are rich in terms of learner participation. In an applied digital pedagogy sense, this trend is consistent with methodologies that focus on the organizational and supporting roles of technology, where digital technologies support rather than change pre-existing teaching methods [10,11].

1.2. Classroom-Based Assessment and Documentation

In early education, classroom-based assessment is an especially important feature of English Language teaching (ELT) situations, in which formal testing is not developmentally suitable or practically feasible. Early childhood education practices of assessment focus on the value of systematic observation in natural classroom settings to record contextual learning [10,11]. As a result, the attentional focus, participation, responsiveness, and use of

emerging language are usually recorded by rubrics and checklists in the classroom activities [4,5]. Even though observation-based approaches are practical and ecologically sound, they are subject to methodological issues, such as the inability to detect short-term changes, subjectivity of the rater, and inconsistency of task execution over sessions [5]. In this regard, classroom-based assessment can be supported by digital tools of pedagogy. New studies of digital documentation practices indicate that these tools can frame what teachers observe, document, and identify as evidence of learning [7]. The literature thus warns against excessive interpretation of rubric scores and the importance of well-defined documentation practices that are well in line with instructional processes [10,11]. Nevertheless, comparatively small studies have focused on the effects of modest, teacher-mediated digital tools on the consistency and traceability of classroom-based records in early ELT classrooms. Combined, these reflections suggest that observational assessment is only effective when the design of the rubrics is coupled with the stability of both instructional and observational conditions under which documentation is done.

1.3. Research Gap and Rationale

Despite the wide integration of digital technology in early ELT classrooms, the available literature is largely outcome-focused, which means it aims at quantifiable gains and intervention impacts. Such a focus has restricted the insight into the workings of digital tools in normal classroom procedures, especially in structuring instruction and facilitating uniform observational recording.

Observational approaches are the key in recording the early language development in ELT research in classrooms, although their efficacy is determined by the permanence of instructional and observational factors. Nevertheless, little has been done to explore the role of teacher-mediated digital tools in organizing and stabilizing these processes. The existence of this gap demonstrates that digital pedagogy should be reconceptualized not only as a mode of instruction delivery but also as an ecologically valid and systematic methodological infrastructure that can be used to observe classroom-based activities systematically in natural settings.

1.4. Purpose of the Study

The current research investigates the usage of teacher-mediated digital pedagogy tools as a part of a multisensory ELT curriculum to facilitate classroom-based recording of early language learning behaviors in Grade 1 learners. It takes the form of a descriptive observational design, which aims to determine how digitally scaffolded instructional settings facilitate reliable and methodical recording in the areas of listening, speaking, reading, and writing.

2. Literature Review

2.1. Digital Technologies in Early English Language Teaching

The use of digital technologies in the classrooms of early English Language Teaching (ELT) and in primary school, where audio playback, visual representation, and simple digital texts are commonly used by teachers to facilitate the teaching process, is widely adopted [1,2]. They are usually absorbed into the regular classroom life rather than introduced as an independent innovation, and they are teacher-mediated and taken as an addition to the existing pedagogical teaching. The digital devices are usually used in the early ELT situations to provide the regular auditory input, shared reference pictures, and coordinated exposure of language forms in listening, speaking, and early reading activities [1]. They are usually adopted due to their accessibility, utility, and conformity to the known classroom practices and not due to technological novelty [3]. Although their application is large, the research has mainly been centered on outcome-based designs that measure the learning gains or compare the digital and non-digital conditions [1,2]. Although these studies can offer important information, they do not focus much on the real operation of digital technologies in the regular classroom processes. Classroom-based language teaching research has long emphasised the importance of understanding instructional processes within authentic learning environments rather than relying exclusively on outcome measures [12,13]. Therefore, the organizational and methodological functions of the digital tools in promoting the consistency of instruction and observation records in the real environments of early ELT have not been considered seriously [14,15]. Recent scholarship indicates that early childhood educational technologies are increasingly being designed to support future-ready pedagogical practices, teacher professional development, and evidence-based instructional decision-making [16–18]. Emerging technologies, including virtual learning environments and digital documentation platforms, have also expanded op-

portunities for observation, assessment, and communication within early childhood settings [19,20]. Furthermore, data-informed educational practices are receiving growing attention, with researchers highlighting both the organisational factors that influence data use and the methodological importance of accounting for contextual variation when analysing classroom data [21,22].

2.2. Multisensory Instruction in Early Language Learning

The concept of multisensory teaching is well-known as an efficient method in the field of early language learning that involves the involvement of auditory, visual, and kinesthetic modalities to foster the engagement of learners, their attention control, and understanding [8]. Multisensory practices in primary ELT are normally characterized by integrated auditory, visual scaffolding, and activities that are physically interactive and engage participation, meaning making.

Besides its pedagogical potential, multisensory instruction has some methodological applicability to research in the classroom. Such activities are often designed, routine, and behavior-intensive, and thus they are amenable to observation and recording in natural classrooms [8,9].

Multisensory instruction can further stabilize instructional conditions when teacher-mediated digital tools in the form of replayable audio input and projected visual scaffolds are in place. Such integration offers common reference points to both the learners and the observers and maximizes the viability and dependability of systematic recording of the behavior of learners in instructional episodes.

2.3. Classroom-Based Assessment and Observational Rubrics

In early childhood education, classroom-based measurement is the key to recording learning, especially where standardized testing is not developed [10,11]. There are many observation-based methods that are employed to record the behaviors of the learners in their natural classroom settings, such as attention, participation, responsiveness, and the emergent language use [4,5].

Observational rubrics are usually used to organize this documentation in the areas of listening, speaking, reading, and writing. These instruments focus on ecological validity and compatibility with the classroom practice, as opposed to psychometric sensitivity at a fine-grain level [10,11]. The observational techniques, however, also have methodological problems, such as subjectivity, variability of task execution, and sensitivity to short-term developmental change [5]. Observational evaluation requires the rubric to be designed and the instructional and observational conditions to be consistent. Digital technologies can be used to complement this consistency by offering consistent auditory and visual points of reference and therefore making learning behaviors more systematically and reliably documented [6,7].

2.4. Digital Pedagogy as Support for Classroom Documentation

Multisensory instruction provides a behaviorally rich environment that supports observational documentation while maintaining developmental appropriateness in early ELT contexts. The systematic, structured, and repetitive nature of multisensory activities creates explicit behavioral clues that could be systematically documented in the classroom interaction [8,9]. These environments have an additional stabilizing effect on instructional conditions when they are supported by teacher-mediated digital tools, including replayable audio input and projected visual scaffolding. This integration would help minimize variability in task presentation and provide common reference points and thus allow more consistency in observing learner behavior within instructional episodes. Although the existing research has mostly focused on the pedagogical advantages of the multisensory input, its methodological applicability has not been explored extensively. Applying digital tools to multisensory spaces could thus facilitate the organization, consistency, and traceability of documentation in classrooms, which identifies a significant yet under-researched facet of digital pedagogy in early ELT settings.

2.5. Synthesis and Positioning of the Present Study

There are three major points evident in the literature. To begin with, digital technologies are commonly integrated into early ELT classrooms, especially as teacher-mediated and inexpensive tools that are incorporated into regular teaching practice [1,3]. Second, observational assessment is key to documenting early language develop-

ment, and its effectiveness highly relies on the consistency of the instructional and observational conditions [10,11]. Third, multisensory teaching environments offer systematic and behaviorally enriched contexts to promote systematic observation [8,9]. Combined, these streams of research indicate that classroom condition organization is an important factor in determining the quality and consistency of observational documentation. Nevertheless, the current research has mostly focused on the outcomes of instruction, and the methodological role of digital technologies to organize those conditions has not yet been explored fully.

The current research addresses this gap by exploring the role of modest, teacher-mediated digital tools in the context of a multisensory ELT curriculum in facilitating the process of recording early language behaviors in various areas. By following a descriptive observational approach, the study situates the digital pedagogy as a methodological aid to the improvement of consistency, traceability, and ecological validity of in-classroom-based documentation in natural teaching contexts.

3. Materials and Methods

3.1. Study Design

The study adopted a pre-post descriptive observational research design that was non-randomized in intact instructional groups to document early language learning behaviors when exposed to real ELT classroom settings. Structured classroom-based rubrics were used to make observations at two times (baseline and post-observation) to observe the routine instructional activities. The design was concerned with ecological validity, as the learning behavior of the learners in the natural classroom environments was studied; however, it did not involve experimental control, and therefore, no causal inferences could be made.

3.2. Participants and Educational Context

The study was conducted in Grade 1 classrooms within an English-medium primary school. A total of 93 learners participated, including 46 learners in a multisensory ELT classroom and 47 learners in a routine ELT classroom. Participants were approximately 6–7 years of age.

Learners remained in their existing classroom groups, reflecting typical school organization. No random assignment or experimental manipulation was implemented. The two instructional contexts represented naturally occurring variations in classroom practice: (i) a multisensory ELT classroom integrating teacher-mediated digital tools, and (ii) a routine ELT classroom following standard instructional practices.

Baseline differences between groups were expected due to the use of intact classroom structures. They were interpreted within the constraints of a descriptive observational framework rather than as effects of instructional conditions.

3.3. Instructional Context and Digital Pedagogy Tools

Multisensory ELT classroom instructions were taught using regular multisensory instructional activities, such as auditory, visual, and kinesthetic learning activities woven into everyday lessons. There was a mediation of digital tools that ensured consistency in the delivery of instruction and systematic documentation.

The digital classroom materials were: (i) audio clips to be used in listening activities, (ii) audio playback devices to allow repetition of exposure to instructional input, (iii) visual scaffolds delivered by means of slide-based materials, and (iv) digitally delivered storybooks that were used during reading activities. These resources were chosen according to their availability and the ability to incorporate them into the normal practice of teaching. In this setting, digital tools serve to stabilize the input in the instruction and offer common auditory and visual reference points in interaction in the classroom. There were no adaptive learning software, automated feedback systems, or learner-controlled digital platforms. In this regard, the digital tools were used as a methodological, but not an instructional resource during this study, which served to maintain uniformity in the presentation of tasks and conditions during observation, but not as a system of independent learning.

3.4. Observational Measures

Learner performance was documented using structured observational rubrics aligned with early primary ELT practice. Separate rubrics were used to assess four language domains: listening (auditory attention, sound dis-

crimination, instruction following, and meaning response), speaking (pronunciation, fluency, vocabulary use, and response ability), reading (word recognition, phonics/decoding, emergent fluency, and meaning response), and writing (letter formation, spelling, word writing, and emergent sentence construction).

Each indicator was rated using a three-point ordinal scale (1 = emerging, 2 = developing, 3 = consistent demonstration). Indicator scores were summed to give total domain scores of 4 through 12.

The rubrics were structured in such a way that they focused more on behaviors observable in the classroom and real-life applicability in instructional settings, as opposed to high-psychometric accuracy. Since the scale range (4–12) was quite limited, the measurement structure was also used to measure general behavioral trends instead of fine variation in the short term. This was directly considered in the analysis by evaluating the distributions of scores and possible ceiling effects, which enabled the determination of the sensitivity of the observational measures. Systematic observation remains a cornerstone of early childhood assessment and educational research [23, 24]. Recent methodological developments have further emphasised the importance of examining teachers' professional vision and attention to language-stimulating interactions when interpreting classroom learning processes [25].

3.4.1. Rubric Structure and Scoring

There were four language domains recorded by separate observational rubrics including listening (auditory attention, sound discrimination, instruction following, and meaning response), speaking (pronunciation, fluency, vocabulary use, and response ability), reading (word recognition, phonics/decoding, emergent fluency, and meaning response), and writing (letter formation, spelling, word writing, and emergent sentence construction).

The rating of each indicator was on a three-point ordinal scale (1 = emerging, 2 = developing, 3 = consistent demonstration). The scores of every indicator were derived and added to provide domain scores of between 4 and 12 to facilitate systematic evaluation of the observable behaviors across domains.

The scale range (4–12) was small, so the rubric was designed to capture the general behavioral patterns, and not the short-term fluctuation of a fine scale. The study of the distributional patterns and the potential ceiling effects had a direct reflection on this property in the analysis.

3.4.2. Rubric Validity and Design Justification

Observational rubrics were developed based on the principles of the existing theories of classroom-based assessment in early childhood education, which presuppose observable behaviors, developmental appropriateness, and ecological soundness to be more significant than fine-grained psychometric accuracy [10, 11].

The support of content validity was based on the design of each domain by some commonly known elements of early language development, such as attention, responsiveness, decoding, and expressive ability. All the indicators were operationalized as observable behaviors that have a clear definition to be used consistently in live classroom settings.

The standard practice by the classroom-based assessment systems also applies to the constrained three-point scale. This kind of scale is less responsive to minor developmental fluctuation, and has practical advantages of feasibility, clarity, and correspondence to real-time observation. This design will guarantee that the measurement strategy will be suitable at an early primary level and will allow systematic and consistent records.

3.5. Data Collection Procedure

The observational data were collected twice when the classroom was engaged in normal activities. The pre-observation was carried out before the instructional period, and the post observation observations were recorded using the same set of observational rubrics to note the trends of performance by the learners. Data collection was included in the normal classroom practice to guarantee ecological validity. Online resources assisted in standardizing the instructional materials and served as a baseline of reference to observe the classroom during the different sessions.

The results were recorded in systematic rubric templates, and the data were systematically recorded and summarized with the help of spreadsheet-based formats. No video was made; all the observations were conducted on the spot in the classroom. These processes are meant to ensure consistency of conditions of observation across sessions as well as to ensure that learner behaviors are effectively recorded.

3.6. Data Analysis

Data analysis was descriptive in nature and focused on the trends of the performance of learners in the instructional settings and observation points. Standard deviation (measures of variability) and central tendency (mean) measures have been calculated, median values, and ranges of scores. The within-group and between-group variation was tested based on the visual inspection of the score distributions.

They paid special attention to the distributional properties, including clustering of the scores and potential ceiling or floor effects on a limited rubric scale (range = 4–12). These analyses were used to determine the sensitivity of the observational measures in measuring the short-term variation in learner behavior.

Numbers were characterized using gain scores (post-observation versus baseline), which were not taken as indicators of instructional impact and were only considered as descriptive. There were no inferential statistical tests, as the study involved natural classroom settings and not experimental groups.

All the analyses were done via Microsoft Excel (Version 365). The interpretation of the distribution of scores was supported by graphical representation, such as a box plot with a scatter overlay.

3.7. Data Availability Statement

The information concerning the results of the current research is not publicly available because of the ethical and privacy concerns of conducting research on minors. The anonymized data can be published at the request of a reasonable person, but with the authorization of the institution and data protection rules.

3.8. Reliability and Consistency Procedures

It was embraced using standardized scoring procedures in which all observations were made by one trained observer. The observer was also checked on sample classroom contexts before the data collection to ensure there was consistency in the translation and application of the rubric criteria. To be able to be reliable, the scoring principles were applied uniformly across the observation sessions. The instructor-mediated digital tools maintained the conditions of the instruction by offering equal presentation of tasks and learning materials. These were to reduce variability brought about by differences in the performance of the tasks and help in internal consistency in the recording of the observations.

No inter-rater reliability check was done. The fact that only one, calibrated observer was involved, however, coupled with the systematized scoring standards and comparatively stable teaching conditions, was intended to minimize the variation in scoring and provide consistency in the observational paradigm.

3.9. Ethical Considerations

The research was undertaken in compliance with institutional and national ethical standards of conducting research with children. It entailed observation of routine classroom activities without any form of intervention and did not bring any form of procedure in the regular way of teaching.

The study involved routine classroom observations conducted during normal educational activities and adhered to institutional and national ethical guidelines for educational research involving minors. Institutional and school-level permissions were obtained before the data were collected. All the information that has been gathered about the learners was anonymized, and the results are presented in the form of groups to maintain the privacy of the participants. The study has been carried out according to the ethical principles of non-invasive observation and protection of the privacy of the participants.

3.10. Methodological Positioning

The methodological principle focused on ecological validity, feasibility, and transparency. The incorporation of digital tools into the daily instructional routine made the study position classroom-based documentation as a natural part of the daily teaching process, not an independent research process that takes place under controlled circumstances.

The given approach favors the core objective of the research: to investigate the role of modest, teacher-mediated digital tools as methodological aids to the systematic records of the early language behaviors in real ELT classrooms. It highlights the significance of recording the processes of learning in the natural classroom settings as opposed to

depending on the controlled experimental designs or outcome-based measurement methods only.

4. Results

In this section, the descriptive summaries of the learner's performance in four domains of language, including listening, speaking, reading, and writing, at baseline and post-observation, are provided. Research was done in two natural learning environments, one of which was a multisensory ELT classroom facilitated by a teacher-mediated digital tool, and the other was a regular ELT classroom.

In all areas, there were large differences in baseline between classroom contexts and small changes within groups over observation points. There was clustering of scores around the mid-to-upper part of the scale, which demonstrates a lack of dispersion and possible ceiling effects due to the restricted range of the rubrics.

These dynamics are relatively predictable in the performance of behavior in predictable teaching situations. The limited variation observed is best understood in relation to measurement constraints, short observation duration, and the gradual nature of early language development, rather than as an absence of learning-related processes.

4.1. Listening Skills Documentation

Listening performance was assessed using an observational rubric evaluating auditory attention, sound discrimination, instruction following, and meaning response. Indicator scores were aggregated to produce total listening scores ranging from 4 to 12. Descriptive statistics are presented in **Table 1** and illustrated in **Figure 1**.

Table 1. Total listening scores by classroom context and observation phase.

Classroom Context	Observation Phase	Mean (M)	Standard Deviation (SD)
Multisensory ELT classroom	Baseline	9.46	1.15
Multisensory ELT classroom	Post-observation	9.63	1.10
Routine ELT classroom	Baseline	6.17	1.15
Routine ELT classroom	Post-observation	6.53	1.18

Note: Scores represent aggregated performance across four listening indicators (possible range = 4–12).

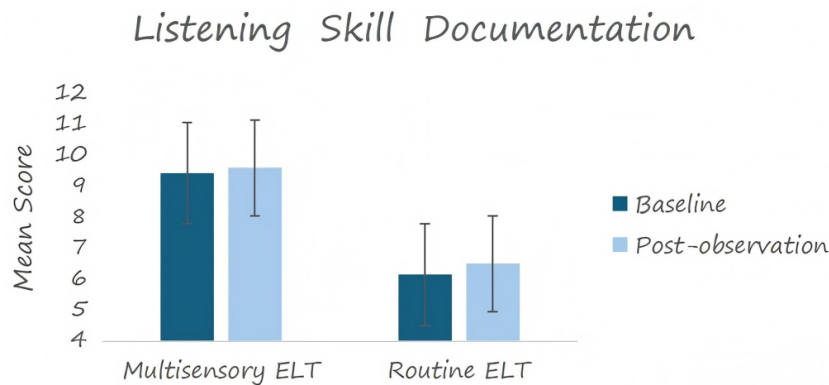


Figure 1. Distribution of total listening scores at baseline and post-observation by classroom context.

Note: Total listening scores represent aggregated performance across four indicators (auditory attention, sound discrimination, instruction following, and meaning response). Possible score range = 4–12.

Listening scores showed minimal variation across observation points in both instructional contexts. The distributions showed that the data were clustered in the middle-to-top range and indicated limited dispersion and reduced sensitivity of the scale; it is not sensitive to capturing small changes.

The relative stability of means and standard deviations over time also suggests steady patterns of performance and represents the shortcomings of aggregated rubric measures in identifying small short-term fluctuations in listening behaviors in early learners. The comparatively higher and more stable listening scores observed in the multisensory ELT classroom may reflect the role of structured auditory and visual supports in promoting sustained attentional engagement and consistent participation during classroom activities.

4.2. Speaking Skills Documentation

Speaking performance was assessed using an observational rubric evaluating pronunciation, fluency, vocabulary use, and response ability. Indicator scores were aggregated to produce total speaking scores ranging from 4 to 12. Descriptive statistics are presented in **Table 2** and illustrated in **Figure 2**.

Table 2. Total speaking scores by classroom context and observation phase.

Classroom Context	Observation Phase	Mean (M)	Standard Deviation (SD)
Multisensory ELT classroom	Baseline	9.57	1.24
Multisensory ELT classroom	Post-observation	9.59	1.17
Routine ELT classroom	Baseline	6.36	1.22
Routine ELT classroom	Post-observation	6.53	1.18

Note: Scores represent aggregated performance across four speaking indicators (possible range = 4–12).

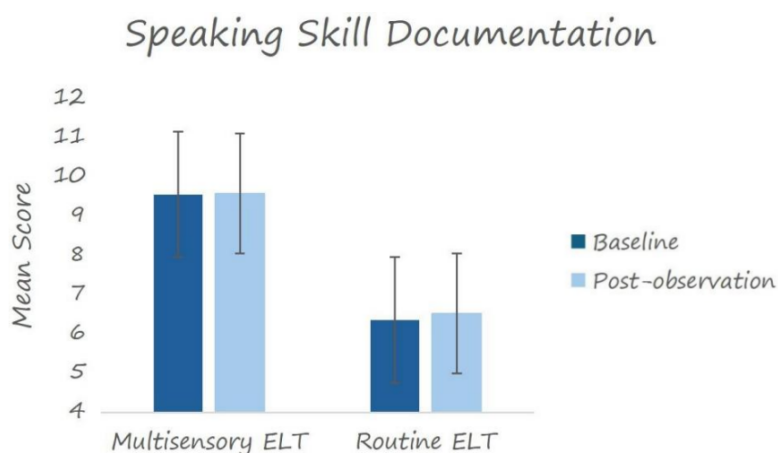


Figure 2. Distribution of total speaking scores at baseline and post-observation by classroom context.

Note: Total speaking scores represent aggregated performance across four indicators (pronunciation, fluency, vocabulary use, and response ability). Possible score range = 4–12.

In both instructional situations, the speaking scores did not vary significantly at different points of observation. The distributional patterns showed that it clustered around the mid-to-upper range, meaning that there was less dispersion and sensitivity of the scale in measuring incremental changes.

The relative stability of means and standard deviation over time is also a sign of repetitive patterns in performance, as well as an indicator of the weaknesses of aggregated rubric measures in identifying short-term variations in speaking behavior in early learners. The relative stability of speaking scores across observation points suggests that oral language development may require longer periods of observation before meaningful changes become evident through classroom-based observational rubrics.

4.3. Reading Skills Documentation

Reading performance was assessed using an observational rubric evaluating word recognition, phonics/decoding, emergent reading fluency, and meaning response. Indicator scores were aggregated to produce total reading scores ranging from 4 to 12. Descriptive statistics are presented in **Table 3** and illustrated in **Figure 3**.

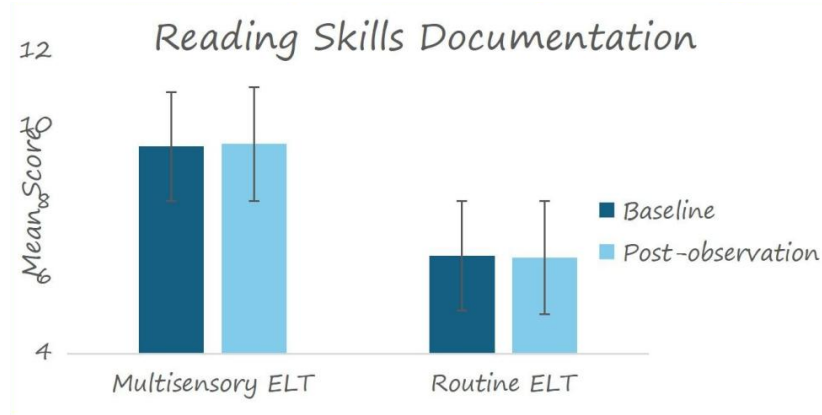
The reading scores were quite similar between baseline and post-observation in the two classroom contexts. The distributions of scores were skewed to greater scores, especially in the multisensory ELT group, which might be a result of ceiling effects.

Standard deviations are also relatively constant, which implies that the performance patterns are consistent across the sessions. Nevertheless, the low variability implies that the rubric mostly represents a set of more general behavioral competencies as opposed to a narrow developmental change in short periods of observation. The higher reading scores observed within the multisensory ELT context may reflect the contribution of shared visual scaffolds and repeated exposure to digitally mediated reading materials that support emergent literacy behaviours.

Table 3. Total reading scores by classroom context and observation phase.

Classroom Context	Observation Phase	Mean (M)	Standard Deviation (SD)
Multisensory ELT classroom	Baseline	9.50	1.21
Multisensory ELT classroom	Post-observation	9.57	1.05
Routine ELT classroom	Baseline	6.60	1.08
Routine ELT classroom	Post-observation	6.55	1.04

Note: Scores represent aggregated performance across four reading indicators (possible range = 4–12).

**Figure 3.** Distribution of total reading scores at baseline and post-observation by classroom.

Note: Total reading scores represent aggregated performance across four indicators (word recognition, phonics/decoding, emergent fluency, and meaning response). Possible score range = 4–12.

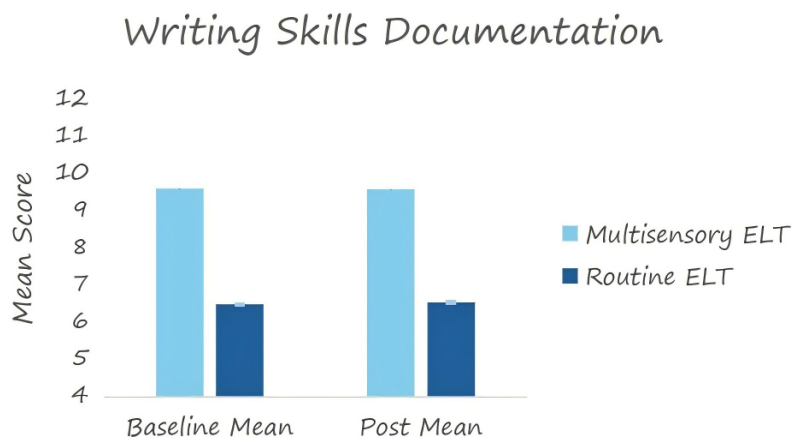
4.4. Writing Skills Documentation

Writing performance was assessed using classroom-based observational rubric evaluating letter formation, spelling, word writing, and emergent sentence construction. Indicator scores were aggregated to produce total writing scores ranging from 4 to 12. Descriptive statistics are presented in **Table 4** and illustrated in **Figure 4**.

Table 4. Total writing scores by classroom context and observation phase.

Classroom Context	Observation Phase	Mean (M)	Standard Deviation (SD)
Multisensory ELT classroom	Baseline	9.61	1.13
Multisensory ELT classroom	Post-observation	9.59	1.13
Routine ELT classroom	Baseline	6.49	1.08
Routine ELT classroom	Post-observation	6.55	1.12

Note: Scores represent aggregated performance across four writing indicators (possible range = 4–12).

**Figure 4.** Distribution of total writing scores at baseline and post-observation by classroom.

Note: Total writing scores represent aggregated performance across four indicators (letter formation, spelling, word writing, and emergent sentence construction). Possible score range = 4–12.

Writing scores demonstrated minimal change across observation points in both instructional contexts. There was a clustering pattern in distributional patterns in the mid-to-high score range with relatively low variability, indicating the consistency of performance over sessions.

These results indicate that the early writing development, which is generally gradual and context-sensitive, might not be easily measured with aggregated rubric scores within short observation periods, especially with limited ordinal scales. The limited variation in writing scores may indicate that early writing development progresses gradually and is less likely to be captured through short-term observational measures using constrained ordinal scales.

4.5. Cross-Domain Summary of Documented Outcomes

In all four language domains, there was a consistent performance of the learners between the baseline and after observation. There were a few differences in means between observation points, and the distribution of the scores was concentrated around the mid-to-higher part of the scale.

This tendency reveals low within-group variance and implies possible ceiling indications of restricted rubric range (4–12). The relative consistency of the standard deviations is another indication that the performance profiles are stable under comparable instructional conditions throughout the observation period.

The results of these suggest that the observational framework succeeded in capturing general behavioral engagement across domains, but the limited variance of scores implies that the framework cannot be sensitive to change in the development over the short term. The observed consistency is therefore best understood as reflecting measurement constraints, short observation duration, and the gradual nature of early language development, rather than an absence of learning-related processes. Collectively, these findings suggest that the observational framework was effective in documenting broad patterns of learner engagement across language domains, although the restricted score range may have limited its capacity to detect subtle developmental changes over time.

5. Discussion

This study examined how teacher-mediated digital pedagogy tools function within multisensory ELT classrooms to support the documentation of early language learning behaviors. Two key patterns emerged: substantial baseline differences between classroom contexts and limited within-group variation across observation points.

The observed stability should not be interpreted as an absence of learning. Instead, distributional patterns, especially concentrating on the upper part of the range of the rubric, point to possible ceiling effects and low sensitivity of the measurement framework. Behavioral change in early language development is typically gradual and usually not detected by an aggregated ordinal scale during short observation periods.

A key contribution of this study is the reconceptualization of digital pedagogy tools as elements of the classroom documentation infrastructure, instead of the immediate sources of learning outcomes. Digital resources delivered by the teacher seem to standardize the input in teaching, and create more stable conditions of observation, which facilitates more reliable and systematic recording of learner behavior.

These results contribute to existing knowledge about digital pedagogy by refocusing the research on outcome-based evaluation to the methodological circumstances that inform the process of observing and documenting learning. In early ELT settings, the utility of digital tools could thus be found in the improvement of the consistency and traceability of observation in the classroom, and not the short-term quantifiable benefits.

5.1. Digital Pedagogy as Documentation Infrastructure

A central contribution of this study lies in conceptualizing digital pedagogy tools as components of classroom documentation infrastructure rather than as instructional interventions. The combination of teacher-mediated digital materials (e.g., replayable audio input and projected visual scaffolds) decreased the variability in the delivery of instruction and provided a common point of reference to both learners and observers.

Such stability is essential, methodologically speaking. Past studies have revealed that differences in pedagogical contributions may induce variation in the observational data [4, 10]. Digitally supported instruction, in this research, formalized major aspects of classroom interaction, and this aspect led to the uniformity in performance trends across domains.

Instead of generating an immediate measurable increase, the digital tools in this case serve as an aid to the circumstances, in which the behavior of learners can be observed and registered with a high degree of reliability. These reframing issues are focused on outcome-oriented paradigms by locating digital technologies in early ELT as methodological tools that facilitate observational consistency, but not as immediate performance outcome drivers.

5.2. Interpreting Stability in Documented Learning Behaviors

The relative stability of language areas has to be decoded. Distributional forms, in particular, the fact that scores are clustered to higher levels, provide reason to believe that the observational rubric was not sensitive enough to react to changes in development on an incremental level. During early language acquisition, the process is usually gradual, non-linear, and dependent on context, and hence short-term change is hard to measure on aggregated ordinal scales.

The specified stability, in its turn, can be considered as the manifestation of the sustained behavioral involvement in the stable learning environments, in comparison to the absence of learning. This difference brings out a major weakness of outcome-based interpretations in the application to observational data, and measurement methods that are sensitive to both behavioral stability and developmental change are required. These results highlight the need to match the sensitivity of measurement with the developmental time scales of studying language during the early stages.

5.3. Baseline Differences in Authentic Classroom Contexts

The differences in the baseline between the cases in the classroom are high and can be explained by the variability of the intact classroom settings. The students in the naturalistic learning settings differ in terms of background exposure, their track record of instruction, and various environmental factors, which cause differences in their initial performance levels [4]. One should make sense of these differences as the contextual features that are reflected by the observational structure instead of being the consequences of the instructional conditions. The consistency in the pattern of the baseline patterns across the language domains indicates that there was a consistent method of documentation that was consistent enough to enable them to capture the existing variation without creating additional noise in the measurement. This conclusion supports the significance of considering data in classrooms in terms of the context in which they were measured. Observational designs put more emphasis on ecological validity than experimental control, and the variability in the baselines must be perceived as a natural phenomenon of real classroom research not as a limitation in the methodology.

5.4. Multisensory Instruction and Observational Documentation

Multisensory teaching classrooms offer a highly structured environment that is behaviorally rich to observe and report. The structured and drilled-out multisensory activities yield definite and visible behavioral signs, which can be systematically documented regarding the engagement of learners in the classroom interaction [8,9].

These environments make teaching situations even more stable when teacher-mediated digital tools are involved. This fusion minimizes variation of task presentation and keeps common points of attention so that observation becomes more consistent and reliable.

Even though the primary interest of the earlier research has been on the pedagogical benefits of multisensory input, the present findings indicate the methodological significance of the multisensory input. When the concept of multisensory instruction is provided in the digital support format, it serves as a stabilization framework that increases the clarity, consistency, and interpretability of the learner behaviors observable in the classroom-based research.

5.5. Implications for Classroom-Based Research in Early ELT

This research has various implications for classroom-based research in the early ELT field. First, they point out that the use of complex or technology-intensive systems is not needed to facilitate systematic documentation. Small, teacher-mediated digital technologies that are integrated into habitual classroom practice can successfully stabilize teaching conditions and increase the consistency of observation. Second, the findings highlight the relevance of focusing on the ecological validity of research in early childhood. In the mainstream classrooms, experimental designs

may be developmentally inappropriate, whereas observational approaches supported by digital technologies can be employed to document learning behaviors in the actual classrooms. Third, it belongs to a larger reconceptualization of digital pedagogy since it dwells on the methodological importance of digital tools. Future studies should also consider the role of digital technologies in enhancing the organization, consistency, and traceability of classroom-based observations, rather than focusing solely on measurable outcomes.

5.6. Methodological Limitations

Several limitations should be considered when interpreting these findings. First, the use of constrained observational rubrics limited sensitivity to detect small-scale developmental changes, particularly given the clustering of scores toward the upper range of the scale.

Second, inter-rater reliability was not assessed. Although observations were conducted by a trained observer using standardized scoring procedures to enhance consistency, some degree of subjectivity remains inherent in observational approaches.

Third, it is limited in terms of generalizability because intact groups of classrooms are not randomly assigned and do not allow one to infer cause and effect. These characteristics are reflective of the shortcomings of classroom-based observational research, where the focus is on ecological validity at the expense of experimental control.

Finally, the descriptive analytical method, despite being appropriate to the research goals, restricts the statistical correlation analysis of variables. More research with more sensitive measures of measurement and extended periods of observation would provide additional data regarding developmental changes.

Directions for Future Research

The documentation methodology adopted in this study can be extended in several ways by future studies. The extended observation periods and observation points would offer more information on the development pattern and yet remain descriptive. It was also possible to include qualitative data, teacher reflections, and structured classroom fields to add to the meaning of the recorded behaviors of learners.

The application of digital documentation practices in other subject areas and age groups should also be studied further to determine how universal the practices can be. Interestingly, future research must be able to differentiate the digital technology to capture learning processes and the technology to transform the instructional practice because they will have different methodological and pedagogical functions. Secondly, more sensitive observational measurement frameworks must be developed to capture both short-term change as well as longer-term change in development. This paper is in line with an emerging methodological thinking that has underlined the need to document the learning processes in the real settings of early childhood classrooms, and future research must further develop methods that strike a balance between ecological validity and measurement sensitivity.

6. Conclusions

This study examined how teacher-mediated digital pedagogy tools function within multisensory ELT classrooms to support the systematic documentation of early language learning behaviors. The results indicated that there were two patterns that were consistent: high baseline differences between the classroom contexts and low within-group variance across the observation points. This stability should not be viewed as a lack of learning, but it reflects measurement constraints, a brief observation period, and the gradual nature of early language development.

Score distributions demonstrated clustering toward the upper range of the rubric, indicating potential ceiling effects and limited sensitivity of the measurement framework to detect short-term variation. These findings highlight the importance of interpreting observational data within the context of rubric design and developmental stages. One of the strongest contributions of the study is that it reconceptualizes digital pedagogy tools as methodological aids and not the immediate drivers of learning outcomes. In this view, teacher-mediated digital tools contribute to stabilising the conditions of instruction and observation that allow more consistent and traceable classroom-based documentation of learner behavior.

In general, the results highlight the necessity of the research strategies in early ELT that focus on the ecological validity, the sensitivity of the measurements, and the systematic recording of the learning processes. The next line

of research must be on how to come up with more sensitive observational structures and longitudinal designs that capture the change in development better but are also consistent with the real context of the classroom.

Author Contributions

Conceptualization, S.S.M. and A.B.R.; methodology, S.S.M.; formal analysis, S.S.M.; investigation, S.S.M.; data curation, S.S.M.; writing—original draft preparation, S.S.M.; writing—review and editing, S.S.M. and A.B.R.; visualization, S.S.M.; supervision, A.B.R.; project administration, A.B.R. Both authors have read and agreed to the published version of the manuscript.

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Data Availability Statement

Data will be available on request.

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Conflicts of Interest

The authors declare no conflict of interest.

AI Use Statement

The authors used AI-assisted language tools (e.g., Grammarly and ChatGPT) solely to improve the clarity, grammar, and readability of the manuscript. These tools were not used for the generation of ideas, data analysis, interpretation, or drawing conclusions. All intellectual content, arguments, and interpretations presented in this study are the original work of the authors. All AI-assisted outputs were carefully reviewed, revised, and validated by the authors, who take full responsibility for the accuracy and integrity of the manuscript.

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