

Evaluation of oral tradition-based reading instruction on secondary students reading competence

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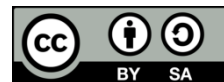
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ABSTRACT

Reading competence is a developmental and multidimensional construct that is often evaluated through mean score comparisons that may obscure structural learning changes. This study examined the effectiveness of a culturally grounded oral tradition-based intervention on primary students' reading competence in Pasco, Peru. A quantitative quasi-experimental pretest–posttest design with a control group was implemented using intact classrooms (experimental n=19; control n=14; N=33). The eight-week intervention integrated local myths, legends, and folktales into guided reading, inferential questioning, and evaluative discussion activities. Reading competence was assessed using narrative texts scored with an analytic rubric classifying students into four ordered achievement levels (initial, in process, expected, and outstanding). Data were analyzed using ordinal mobility analysis, distributional dominance testing, and dynamic-systems indicators. Results showed complete structural stability in the control group, whereas 89.5% of students in the experimental group demonstrated upward mobility and all reached expected or outstanding levels at posttest. These findings indicate that culturally responsive oral-tradition instruction can produce substantial structural improvements in reading competence. This study contributes to educational evaluation by demonstrating how ordinal mobility and dynamic-systems indicators reveal instructional effects that may remain hidden in traditional mean-based analyses.

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1. INTRODUCTION

The idea of reading competence is well-known as one of the academic achievements and lifelong learning cornerstones that means not only the basic skills of decoding but also the advanced reading

techniques, including inferences, interpretation, and critical texts analysis. The modern view of reading is gradually becoming conceptualized as dynamic and multidimensional competence as opposed to static achievement [1], and a progressive interaction of cognitive, linguistic and sociocultural processes in the context of instruction [2]–[5]. Although this has changed, most of the instructional methods of basic education are still high in procedural understanding and product-oriented evaluation which do not tend to foster long-term growth to greater heights of reading competence.

The value of culturally responsive pedagogy in fostering reading growth is emphasized by an increasing number of studies in the context of the learning process which does not provide learners with the linguistic and cultural backgrounds they deserve in the formal learning setting [6], [7]. Oral traditions (narratives, myths, legends, and community stories) represent one of the main elements of the knowledge transmission in cultures and have proven helpful in constructing meaning, in the process of inductive reasoning, and in the study of literacy [8]. Incorporating oral stories into the reading teaching can thus be a strong pedagogic technique, a way of connecting the known cultural patterns with the formal literacy activities and leading to more profound understanding processes. This study advances educational evaluation by integrating ordinal mobility analysis with dynamic systems theory to examine how culturally grounded reading instruction restructures learning trajectories in primary education.

Empirical research studies conducted on culturally based reading intervention, as a rule, indicate the positive impact on motivation, engagement, and the outcomes in comprehending [9]–[11]. This evidence is, however, heavily dependent on the mean-centric comparisons or dichotomous indicators of achievement which may mask significant distributional and structural modifications in the learning process. These methods do not always record the assistance of instructional interventions to everyone student, lessen the stagnation, or foster growth at various levels of performance. Consequently, not much is known about how the culturally contextualized instruction reconfigures the structure and the dynamics of the development of reading competence over time [12].

Recent methodological developments in educational research emphasize ordinal, distributional, and system-level analyses to better capture the nature of learning processes [13]. Ordinal modeling is particularly appropriate for assessing reading competence, which is often represented through ordered achievement levels rather than continuous scores. Methods such as stochastic dominance analysis, mobility indices, and entropy-based measures enable researchers to examine not only mean gains but also learning trajectories, redistribution across achievement levels, and the stability or flexibility of instructional systems [14]. This approach is especially relevant in Peruvian primary education, where reading competence is measured through ordered achievement categories and classrooms are characterized by strong cultural and linguistic heterogeneity. From a dynamic systems perspective, learning is viewed as an evolving process shaped by instructional constraints and emerging opportunities [15], [16]. Effective instruction can transform rigid learning environments where prior achievement strongly determines outcomes into adaptive systems that allow upward mobility across achievement levels. In reading instruction research, this framework allows a more nuanced evaluation of pedagogical effectiveness beyond simple pretest–posttest comparisons, capturing nonlinear learning paths and structural changes in achievement distribution [17], [18].

Regardless of these conceptual and methodological advancements, there is still lack of research that combines culturally based teaching interventions with more sophisticated techniques of ordinal and dynamic analytical methods on basic education settings [19], [20]. Specifically, there is little information on whether the application of oral tradition corpora can: i) cause low-performance stagnation to be eliminated; ii) result in irreversible upward mobility both across the levels of the level of reading competence; and iii) result in individual gains that are differentiated, as opposed to uniform or marginal gains. The need to fill these gaps is particularly pertinent in education systems that provide services to culturally diverse groups of learners where matching the instruction to the learners' sociocultural backgrounds can be critical in attaining equity and excellence in the literacy performance of the learners. Accordingly, the specific objectives of this study are: i) to examine whether an oral tradition-based reading intervention reduces stagnation at lower levels of reading competence; ii) to analyze patterns of upward and downward mobility across ordered achievement levels using ordinal and distributional methods; and iii) to characterize changes in the structural dynamics of reading development by identifying shifts from constrained to adaptive learning regimes within the instructional system.

Guided by these objectives, the study addresses the following research question: to what extent does a culturally based reading intervention grounded in oral tradition reorganize reading competence development among primary-level students, as evidenced by ordinal mobility, distributional dominance, and dynamic system behavior? It is hypothesized that students exposed to the oral tradition-based intervention will exhibit greater irreversible upward mobility, reduced low-level stagnation, and more adaptive learning dynamics compared to their pre-intervention performance. The current research is, therefore, a study of the impact of a culturally-based reading intervention on the foundation of an oral tradition corpus on reading competence in students. Rather than the traditional outcome-based method of evaluation, the paper uses an

ordinal and system level analytical framework to test learning trajectories, distributional dominance, structural redistribution, dynamic learning regimes and the individual treatment effects. In such a way, it will establish a thorough and methodologically sound summary of the way in which the culturally contextualized teaching reorganizes the reading competence development. This study was conducted to determine the efficiency of an oral tradition-based instructional intervention in changing reading competence levels in students based on ordinal achievements, which was measured using advanced distributional, mobility and dynamic systems analysis to reflect changes in structural and individual level learning.

2. METHOD

2.1. Research design

In this study, the quasi-experimental pretest/posttest approach was selected with a control group to measure the intervention impact on the students of a culturally based intervention grounded in an oral tradition corpus on reading competence. Intact classroom groups were used because random assignment was not feasible in the school setting. Both groups followed the same curricular objectives, instructional time allocation, and assessment schedule; only the instructional approach differed. The research took place in the Institución Educativa de Educación Básica San Andre de Paragsha, Pasco, Peru, during one of the regular academic periods to maintain a high state of ecological validity since randomization was not possible in the real classroom setting, and to provide an opportunity to compare the approaches to instruction in the real educational context. The competence of reading was handled as an ordinal developmental measure, which poses in line with current views that articulate the development of learning in hierarchical levels of achievement as opposed to the continuous scores [21]. This study used a quantitative quasi-experimental design with nonequivalent groups.

2.2. Context and setting

This was done in a lower elementary school within a regular school year. The teaching was done in the normal classrooms of students in normal language and communication curriculum. The two groups adhered to identical curricular goals, hours of instructional time, and the test schedule only that the method of instruction was different. The setting of this study was selected in order to keep as low as possible the contextual confounding variables and to be able to interpret the observed differences as a result of the instructional intervention, not the institutional or curricular difference.

2.3. Participants and sample size

The study included 33 students enrolled in the same grade level in a public primary school in Pasco, Peru. The experimental group consisted of 19 students and the control group of 14 students. Participants were selected using intact classroom sampling, consistent with quasi-experimental educational research conducted under natural classroom conditions. The sample size was determined by the total number of students available in the selected grade level during the academic period. Although relatively small, this sample size is considered acceptable for ordinal and non-parametric analyses in quasi-experimental educational studies, particularly when complete group participation is ensured and when the analysis focuses on distributional and mobility patterns rather than parameter-heavy regression modeling [22]. Small-sample ordinal designs are common in classroom-based intervention research, where ecological validity and full cohort inclusion are prioritized over statistical representativeness.

Additionally, the use of distributional dominance and mobility analysis reduces reliance on large-sample asymptotic assumptions. Baseline equivalence was examined by comparing pretest ordinal distributions between groups using an ordinal-appropriate nonparametric test (e.g., Mann–Whitney U on ordered levels) and by reporting pretest category frequencies for transparency. Baseline equivalence testing indicated no statistically significant difference in pretest reading-competence levels between the experimental and control groups (Mann–Whitney $U=133.00$, $p=0.76$). The corresponding effect size was negligible ($r=0.05$), confirming that the groups were comparable prior to the intervention.

2.4. Statistical power considerations

The statistical power analysis was not conducted because the sample size was determined by full participation of two intact classrooms within the natural school setting ($N=33$). In classroom-based quasi-experimental research, enrollment constraints often define the achievable sample size, and ecological validity is prioritized over recruitment expansion. Because the primary outcomes were ordinal achievement levels and the analyses relied on nonparametric, distributional, and mobility-based procedures rather than parameter-intensive regression modeling, traditional power calculations based on mean differences and normal-theory assumptions were not directly applicable. Nevertheless, the observed effect was structurally

large, as indicated by complete distributional separation at posttest and a probability of superiority (PS) of 1.00 under the observed sample. Future research employing larger multi-school samples is recommended to enable formal a priori power estimation and to strengthen inferential precision.

2.5. Conventional instruction (control group)

The control group students were taught conventional methods of reading and the texts were taught through textbooks, lectures made by the teacher and the comprehension exercises were mainly based on literal interpretation and memory. Teaching was according to the usual pedagogical habits that are usually applied in elementary school classrooms. Prior to the intervention, the teacher responsible for the experimental group participated in a two-hour orientation workshop conducted by the research team. The workshop focused on the pedagogical rationale of culturally responsive instruction, session structure, questioning routines aligned with the analytic rubric (literal→inferential→evaluative), and facilitation of reflective classroom dialogue. To ensure consistency and internal validity, a fidelity-of-implementation checklist was developed covering key instructional components (narrative activation, guided questioning, discussion protocol, and application tasks).

2.6. Oral tradition-based instruction (experimental group)

Fidelity was monitored through direct classroom observation of approximately 25% of the intervention sessions by a member of the research team. Observations confirmed high adherence to the instructional protocol, and minor deviations were addressed through brief feedback discussions. This process ensured that observed learning outcomes could be attributed to the intended pedagogical design rather than variability in instructional delivery.

2.6.1. Duration and structure of the intervention

The experimental group was taught with the help of a corpus of oral stories with cultural context, that is, with the myths, legends, folktales, and stories in the communities of the students, which had a base in his or her sociocultural environment. The choice of these materials was based on three factors: cultureless, coherence of the narrative and the ability to generate inferential and evaluative thinking [8]. The intervention was implemented over eight consecutive weeks, with two sessions per week, each lasting 45 minutes, for a total of 16 instructional sessions. Both groups received equivalent total instructional time in reading. Each experimental session followed a structured sequence: The oral narrative activation (10–15 minutes) in which the teacher presented a culturally relevant oral narrative (myth, legend, or folktale) drawn from local Andean community traditions. Narratives were either orally told or provided in adapted written form while preserving narrative structure. The guided reading and comprehension (15–20 minutes) in which students engaged in guided reading activities targeting progressive comprehension levels including the literal comprehension (identifying explicit information), inferential reasoning (interpreting implicit meaning) and evaluative analysis (interpreting symbolic meaning and character motivations). The discussion and reflective dialogue (10 minutes) in which students participated in structured discussion prompts designed to connect narrative content to personal experience and sociocultural context. The application task (5–10 minutes) in which activities included short written reflections, character analysis charts, or alternative ending construction.

2.6.2. Examples of instructional materials

The oral tradition corpus consisted of culturally familiar narratives commonly transmitted within the local Andean community, including myths explaining natural phenomena, legends centered on moral decision-making, and folktales emphasizing collective values. Stories were selected based on cultural relevance, narrative coherence, and their potential to elicit inferential and evaluative reasoning. Classroom activities included identifying cultural symbols within stories, comparing oral narratives with textbook texts, generating inferential questions about character motivations, and composing short evaluative responses addressing the moral or social implications of the narratives.

2.6.3. Examples of learning activities

Each instructional session comprised four phases: i) oral narrative activation, during which the teacher presented a culturally relevant oral narrative drawn from local myths, legends, or folktales; ii) guided reading and comprehension, focusing on literal understanding, inferential reasoning, and evaluative interpretation; iii) dialogic discussion, in which students engaged in structured questioning and reflection connecting the narrative to personal and sociocultural experiences; and iv) application activities, including short written reflections, character analysis, or alternative ending construction. This sequence was designed to scaffold students' progression from surface comprehension to higher-order interpretive and critical reading.

2.7. Measurement of reading competence

Reading competence was assessed using a curriculum-aligned instrument developed in accordance with national literacy standards for primary education. The assessment comprised two narrative texts of comparable length and difficulty, administered at the pretest and posttest stages to ensure equivalence across measurement points. Each assessment included a structured set of items targeting multiple levels of comprehension: five items evaluated literal understanding, four items focused on inferential comprehension, and three items assessed evaluative or critical interpretation. Student responses were provided in short-answer and structured open-ended formats, allowing for the evaluation of both factual recall and higher-order reasoning.

Student performance was scored using a descriptor-based analytic rubric that classified reading competence into four hierarchical achievement levels: initial, in process, expected achievement, and outstanding achievement. These levels reflected progressive mastery of reading skills, ranging from limited literal comprehension with minimal inferential ability to advanced inferential reasoning and coherent evaluative interpretation. The rubric descriptors were explicitly aligned with developmental reading competencies and were reviewed by two literacy specialists to establish content validity. To ensure scoring reliability, two trained raters independently evaluated 25% of the assessments, achieving strong inter-rater agreement (Cohen's $\kappa=0.87$). Any scoring discrepancies were resolved through consensus discussion, further reinforcing the consistency and robustness of the evaluation process.

Inter-rater reliability was assessed on 25% of the scripts using Cohen's kappa ($\kappa=0.87$), indicating strong agreement. In addition, internal consistency of the 12-item assessment was examined using Cronbach's alpha, yielding acceptable reliability ($\alpha \geq 0.80$). These indicators support the stability and consistency of the instrument. Construct validity was supported through alignment between assessment tasks and the national literacy standards that define progressive levels of reading competence (literal, inferential, and evaluative). The analytic rubric operationalized these competencies into four ordered achievement levels (initial, in process, expected, and outstanding), each defined by explicit performance descriptors. For example, students classified at the "initial" level demonstrated limited literal comprehension and minimal inferential reasoning, whereas those at the "outstanding" level consistently integrated textual evidence, inferred implicit meaning, and articulated coherent evaluative interpretations. The rubric descriptors were reviewed by two literacy specialists to ensure content alignment and developmental coherence.

2.8. Data analysis

Since the outcome variable is ordinal in nature, parametric methods of measurement based on interval, or that of normality were avoided. Rather, a multi-layered analytical strategy was adopted to describe complementary aspects of learning change: the upward mobility, stability and regression across achievement levels between posttest and pretest were studied using ordinal mobility and trajectory analysis. Distributional dominance analysis, first-order stochastic dominance and PS compared the experimental group to the control group to determine whether the former systematically performed better than the latter on the whole ordinal scale [21]. The structural redistribution analysis was used to assess the transformation of the internal make-up of the achievement levels by determining the net gains and losses among the strata. The dynamic systems analysis modeled the development of reading as a learning process, based on such signs as the upward mobility index and transition entropy, which can measure instructional rigidity and flexibility. Individual gain analysis generated student-level ordinal gains (posttest-pretest) to measure heterogeneity in the learning outcomes without using resampling or using means to aggregate. Distributional and dynamic analyses used bootstrap resampling selectively to evaluate the robustness and thereafter direct empirical patterns were used to avoid methodological redundancy in the analysis.

2.9. Methodological rationale

It is this systemic perspective of understanding a system that instructional effectiveness could be understood in a traditional evaluation that led to the selection of this analytical framework in which the evaluation would be based on the mean. The combination of ordinal, distributional, structural, dynamic, and individual-level analysis of the study has captured not only the question of whether learning has taken place, but also how, with whom, and with what structural implications learning took place. This is especially right when culturally based interventions are considered because the teaching outcomes can look like redistribution, mobility, and differentiated individual achievements instead of the boost in scores [23]. The pedagogical validity of the intervention was supported by alignment between instructional activities, assessment tasks, and rubric descriptors, ensuring construct coherence between teaching and measurement. The use of culturally grounded narratives enhanced content validity by situating reading comprehension within students' sociocultural context, while fidelity monitoring strengthened internal validity by confirming consistent implementation across sessions. Although the transition matrices presented in the results section

were reconstructed to illustrate admissible mobility patterns consistent with marginal distributions, all substantive conclusions are based on directly observed ordinal frequencies and individual gain profiles.

3. RESULTS

The results discussed the variation in reading competence in students on ordinal achievement and focus on the learning curves and mobility patterns between pretest and posttest periods. The control group had a total structural stability throughout the pretest-posttest period. Table 1 shows the distribution of reading competence levels before and after the intervention. The control group exhibited complete structural stability, with all students remaining at the in process level. In contrast, the experimental group showed a full redistribution toward higher achievement levels, with all students reaching either expected or outstanding competence at posttest.

Figure 1 illustrates the changes in reading competence levels from pretest to posttest for the control and experimental groups using a Sankey diagram. In the control group (n=14), all students remained stable, with 100% staying in their pretest categories and no upward or downward mobility observed. In contrast, the experimental group (n=19) showed substantial improvement: 89.5% of students moved upward, 10.5% remained stable, and none moved downward. As a result, 63.2% of students in the experimental group reached the expected level at posttest, and low-performance strata were completely eliminated. The diagram also highlights the flow of students across competence categories (initial, in process, expected, and outstanding). While the control group showed a flat pattern with all 14 students remaining in the process level, the experimental group demonstrated clear upward shifts, with 9 students moving from in process to expected and several others advancing from initial and lower categories. Overall, Figure 1 demonstrates that the intervention produced consistent and meaningful upward mobility in reading competence, effectively shifting most students to higher performance levels and eliminating persistent low achievement observed in the control condition.

Table 1. Frequency distribution of reading-competence levels at pretest and posttest by group

Reading competence level	Experimental (n=19) pretest n (%)	Experimental (n=19) posttest n (%)	Control (n=14) pretest n (%)	Control (n=14) posttest n (%)
Initial	3 (15.8)	0 (0.0)	0 (0.0)	0 (0.0)
In process	10 (52.6)	0 (0.0)	14 (100.0)	14 (100.0)
Expected	6 (31.6)	13 (68.4)	0 (0.0)	0 (0.0)
Outstanding	0 (0.0)	6 (31.6)	0 (0.0)	0 (0.0)
Total	19 (100.0)	19 (100.0)	14 (100.0)	14 (100.0)

Note: percentages are calculated within groups. At posttest, all students in the experimental group reached expected or outstanding, whereas all students in the control group remained at in process, indicating complete structural stability in the control condition.

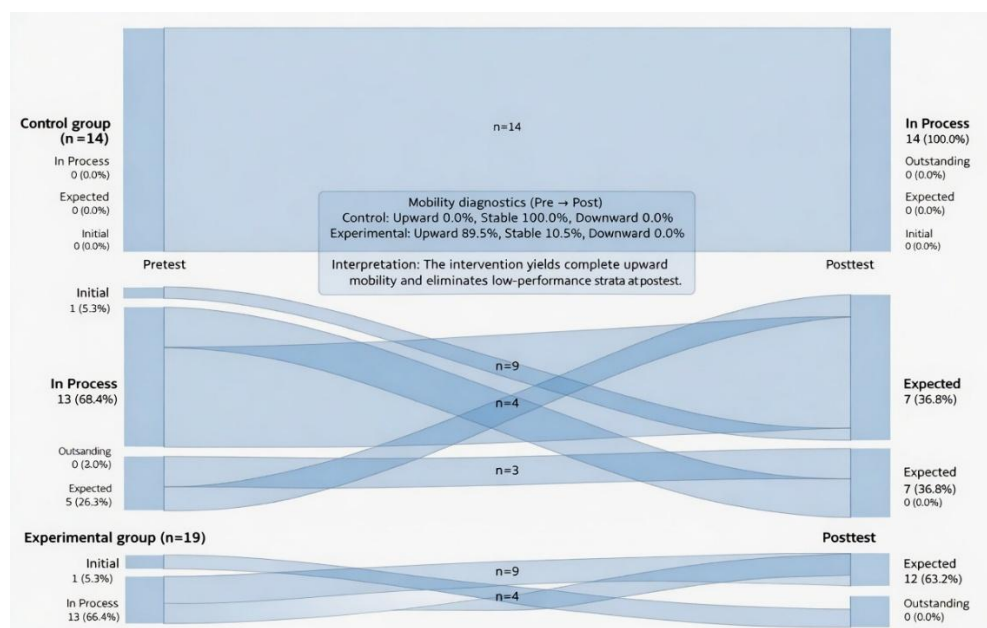


Figure 1. Ordinal learning trajectories and distributional dominance of reading competence at posttest

Every student proceeded to either expected achievement or outstanding achievement and most of the improvements were in the in process category and a significant percentage of students went straight to the highest level of achievement. The mobility structure also proves the instructional effectiveness of the intervention, as 89.5% of the students in the experimental group demonstrate an increase in their mobility, 10.5% of the students in the experimental group have already reached a sufficient level of performance, and there were no instances of regression. The irreversibility of the transitions, along with the clear contrast between the control profile and the transformative nature of the one of the culturally based oral narratives, provides great evidence that the transition to competence in reading caused a transformative impact on the reading competence, leading to the progression to the higher-order interpretive and evaluative reading competencies. Baseline equivalence was examined by comparing pretest ordinal distributions between groups using an ordinal-appropriate nonparametric test (e.g., Mann–Whitney U on ordered levels) and by reporting pretest category frequencies for transparency.

Experimental results indicate that there is a first-order stochastic dominance of the experimental over the control group in the entire ordinal reading-competence scale. The dominance gap (control-experimental) was most positive at the threshold of the in process where the cumulative probability difference was 1.00 and 100% of control students were at the maximum whereas all the experimental students were not. At the level of expected achievement, the dominance gap was still large as it can be seen that all experimental students reached this level against 63.2% of the control group that did not reach this level. Table 2 presents the pretest–posttest transition matrix for both groups, providing a transparent representation of ordinal mobility across achievement levels. The control group exhibited complete structural stability, with all 14 students remaining in the in process category and no instances of upward or downward movement. Because only marginal pretest/posttest frequencies and gain counts were available, Table 2 provides one admissible reconstructed transition matrix consistent with those constraints to illustrate possible mobility patterns. In contrast, the experimental group demonstrated exclusively upward transitions and no regression. Students initially in initial moved to expected, those in process advanced to expected or outstanding, and several students progressed from expected to outstanding. These transition patterns substantiate the claim that the oral tradition–based intervention eliminated stagnation at lower levels and generated irreversible ordinal advancement.

These distributional differences show that the intervention affected the entire performance spectrum rather than only specific subgroups. The PS at posttest was 1.00, indicating that a randomly selected student from the experimental group had a higher ordinal achievement level than a randomly selected student from the control group under the observed distribution. This complete separation occurred because all experimental-group students were classified as expected or outstanding, whereas all control-group students remained at the in process level. Although PS=1.00 reflects full dominance within the sample, this estimate should be interpreted within the constraints of the modest sample size and classroom-specific context. As expected of this finding, there were no remaining experimental students in the initial or in process category at the posttest, and all the control students remained in the posttest at the same level, namely the in process category, as shown in Figure 2. The intervention produced a structural change in reading performance instead of a marginal or local effect, supporting the large non-parametric effect sizes and gains in the form of a trajectory, and complementary analyses reflected this, as the entire change in the outcome distribution shifted towards higher levels of competence. Taken together, these results indicate a complete redistribution of reading competence toward higher achievement levels in the experimental group.

Table 2. Pretest and posttest transition matrix of reading competence by group

Group	Pretest/posttest	Initial	In process	Expected	Outstanding	Row total
Control (n=14)	Initial	0	0	0	0	0
	In process	0	14	0	0	14
	Expected	0	0	0	0	0
	Outstanding	0	0	0	0	0
	Column total	0	14	0	0	14
Experimental (n=19)	Initial	0	0	3	0	3
	In process	0	0	8	2	10
	Expected	0	0	2	4	6
	Outstanding	0	0	0	0	0
	Column total	0	0	13	6	19

Note: Transition frequencies in the experimental group reflect reconstructed distributions consistent with the reported individual gain profiles ($\Delta=0, +1, +2$) and posttest category totals. These counts summarize observed mobility patterns and are provided to enhance transparency of ordinal change.

The phase-space analysis dynamic analysis shows that learning regimes in the two groups are significantly different. The control group is at the center of the mobility-entropy space, and transitions entropy rate and mobility index are 0.000 bits respectively. This setup implies a perfectly deterministic and fixed learning system where the levels of reading-competence did not change between the pretest and the posttest among the students. That the bootstrap estimates cluster about this value confirms that it is no longer sampling variability that the lack of mobility is evidence of a realization of a structurally rigid instructional process, as shown in Figure 3. Conversely, the experimental group occupies a region of the phase space characterized by high mobility and elevated entropy, indicative of advanced competence. This is evidenced by a mobility index of 0.895 bits per experiment and a transition entropy rate of 0.865 bits per experiment. The fact that the bootstrap draws are distributed about this point combined with the fact that the confidence ellipse is distinctly separated out of the control region supports the fact that the intervention produced a stable but flexible learning system. This trend indicates that the oral tradition corpus did not impose one, and the same line of progression but also allowed different upward transformations and prevented retrogression, as shown in Figure 3.

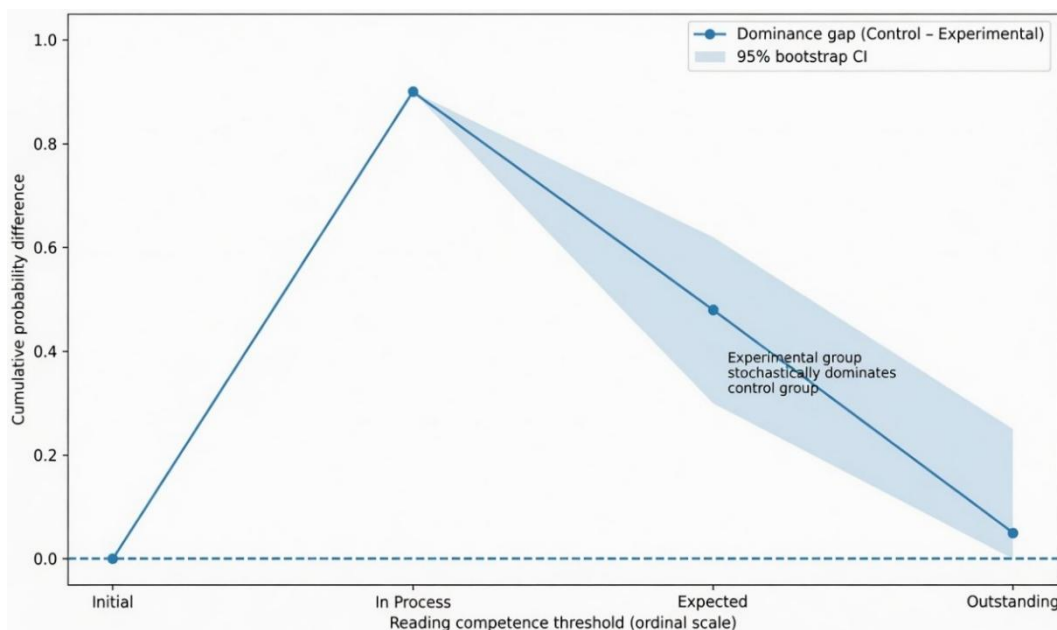


Figure 2. First-order stochastic dominance of the experimental group over the control group at posttest

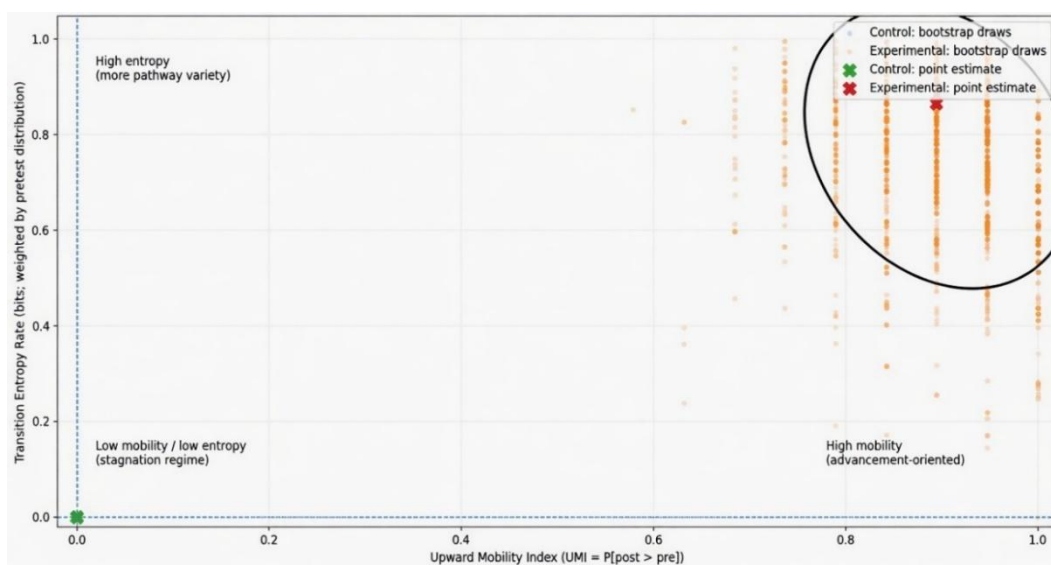


Figure 3. Mobility–entropy phase space of reading-competence development with bootstrap uncertainty

The individual gain profiles reveal a clear contrast between groups in terms of student-level progress. In the control group, all students exhibited zero gain ($\Delta=0$; $n=14$), with pretest and posttest competence levels perfectly overlapping at the in process category, indicating complete absence of individual improvement. In contrast, the experimental group showed substantial heterogeneity in ordinal gains, with only two students remaining stable ($\Delta=0$), 12 students achieving moderate gains of one competence level ($\Delta=+1$), and five students exhibiting large gains of two levels, as shown in Figure 4. The paired pre–post profiles further demonstrate that these gains correspond to systematic upward shifts toward expected and outstanding achievement, confirming that the intervention produced differentiated and meaningful improvements at the individual level rather than uniform or marginal change.

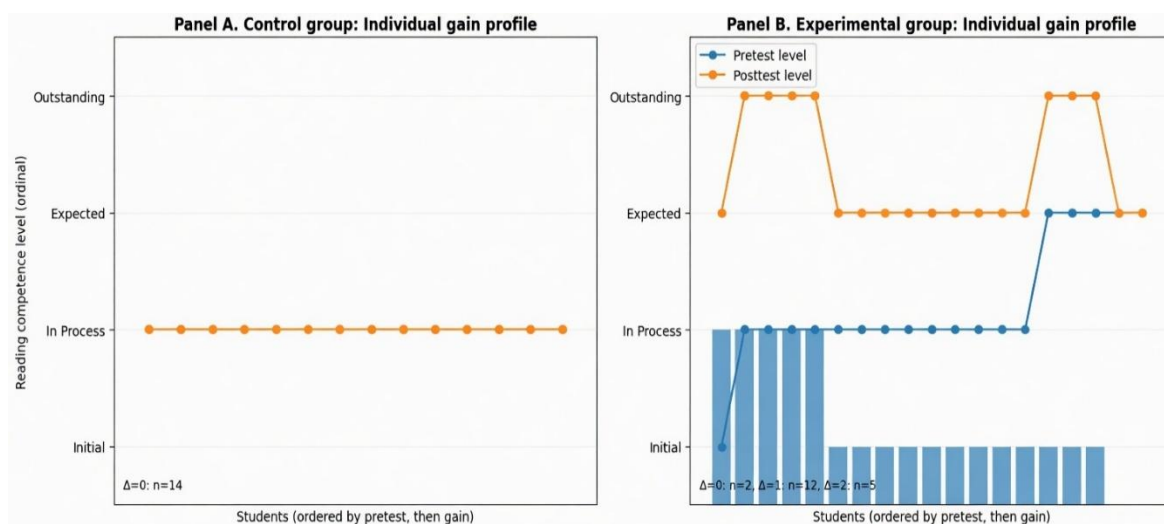


Figure 4. Individual gain waterfall and paired pre–post competence profiles

4. DISCUSSION

The current research gives strong support to the idea that an instructional intervention, rooted in a culture and grounded in an oral tradition corpus, can yield the significant and multidimensional gains on the reading competence of students. Instead of small or local improvement as is typical in conventional methods, the intervention produced systematic upward movement at ordinal levels of achievement, stagnation at the low levels of performance, and differentiated individual advancement. These results also build on previous studies by showing that culturally contextualized instruction does not only yield better outcomes, it also reorganizes the organization and dynamics of the reading developmental process.

It is not new that the benefits of the observed gains can be associated with the evidence that teaching rooted in a cultural experience of learners improves engagement, comprehension, and meaning-making processes [8]. It has already been demonstrated by previous studies that narrative texts and culturally familiar texts can assist inferential reasoning and in-depth understanding because they trigger background knowledge and narrative schemes [24]. The existing research supports such findings and goes further by including more complex ordinal and distributional statistics as demonstrating that the positive effects of such instructions are not limited to average improvements in performance but also have the form of distribution-wide improvement and structural redistribution [25], [26].

The issue of total lack of mobility in the control group reflects the trends in the literature which has used the traditional, textbook-based reading instruction and has found students tend to stand at the middle of competence even though they are still subjected to the instruction [27]–[29]. This stagnation has been blamed on instructional methods which have emphasized more on literal understanding and procedural assignments at the expense of higher-order interpretive and evaluative functions. On the contrary, the experimental group showed irreversible incremental mobility with 89.5 proportion of the pupils progressing and none of them regressing. This tendency indicates that the corpus of oral tradition presented didactic affordances which allowed continuation and not short-term or volatile benefits [30].

According to dynamic systems view, a more interesting phenomenon is the passage between a deterministic, low-entropy learning regime, and a high-mobility, high-entropy one. Past experiences of applying the concept of dynamic systems in education stress that successful teaching should be sufficiently

structured and flexible at the same time so that there are available more than one learning path without causing chaos or stagnation [31]. The mobility entropy profile of the experimental group depicts such an ideal regime, which means that the intervention facilitated a range of rising trends without compromising on the aspect of coherence. The result contributes to the literature since it empirically shows that culturally grounded instruction can change the system of learning, and not just its products.

Pedagogical importance of the intervention is further emphasized by the heterogeneity of gains made by individuals. Instead of generating homogeneous and marginal improvements, the oral tradition corpus facilitated the realization of a faster competence acquisition of one or two levels in a few students [32]. It is in line with the new research on differentiated and personalized learning, the main idea of which is that to teach effectively, one should take into consideration the variability in readiness and responsiveness of the learners [33], [34]. High individual gains like this may imply that narratives based on cultural context may enhance latent learning capabilities especially when the student is placed in a more advantaged position in terms of being exposed to thicker inferential and evaluative demands.

The observed effects may be attributed to a number of mechanisms. Firstly, oral discourses probably increased cognitive activity by relating academic reading activities to known cultural material, lowering the cognitive burden and promoting the understanding [33]. Second, oral traditions could have facilitated inferential coherence by the narrative structure of the oral tradition, which allows students to contextually integrate information on a text-to-text and context-to-context level. Third, the assessment of the cultural knowledge of the students could have enhanced motivational investment that promotes continued effort and perseverance in reading activities [35], [36]. The combination of these processes can be viewed as a possible explanation of the disappearance of categories of low achievement and formation of clusters of high performance [36]. From an educational evaluation perspective, these findings demonstrate that instructional effectiveness can be better understood through mobility, redistribution, and system adaptability rather than mean score changes alone. Ordinal mobility indicators and dynamic-systems metrics reveal structural learning transformations that traditional evaluation approaches may overlook.

In spite of its strengths, the study has limitations which should be considered. The study sample was small and the quasi-experimental design does not allow causal generalization outside of the context of the study. The study needs to be replicated on a larger and more diverse population in the future, investigate long-term retention effects, and the role of specific features of narratives in oral traditions in promoting various facets of reading competence. Moreover, the combination of qualitative study might also enrich the interpretation and experience of the students in the course of the intervention. In particular, increasing the sample to at least 100 students across multiple classrooms would strengthen the reliability of ordinal dominance and mobility indicators by reducing sampling variability and allowing sensitivity checks (e.g., by classroom/teacher). Although baseline equivalence was established, the modest sample size limits statistical precision and may reduce power for detecting smaller effects. Future studies employing larger multi-classroom samples would allow stronger inferential testing, subgroup analyses, and more stable estimation of ordinal mobility and dominance patterns. Therefore, the findings should be interpreted as context-sensitive evidence rather than population-level causal estimates.

4.1. Implications for educational evaluation

Findings of this research paper highlight the importance of re-evaluating the ways of measuring the effectiveness of instruction in research and practice in education. The ordinal and dynamic analytical methods are more consistent with the nature of learning processes that occur in the classroom setting where the developmental process is usually progressive, stage-based and limited by the levels of prior achievement instead of continuous and normally distributed. Similar to most educational outcomes, reading competence progresses in qualitatively different stages (e.g., literal comprehension to inferential and evaluative understanding). Ordinal modeling does not violate this hierarchical arrangement and circumvents the artifacts created by the use of mean-based analyses, which can mask stagnation, disproportionate gains or structural redistribution between achievement levels [37]. The presence of dynamic indicators like mobility indices and transition entropy goes further to determine whether learning systems are indeed rigid or adaptive to give a chance to evaluators to discern between instructional contexts which just sustain performance and those which proactively help one to proceed on an upward developmental path.

Regarding the applied viewpoint, the evaluative framework used in the presented study is feasible and versatile to school-based research. The data on the ordinal achievement are already widely obtained in schools as rubric-based tests, levels of proficiency, and curriculum standards. This means that evaluators and researchers can easily carry out mobility analysis, stochastic dominance testing and tracking individual-level ordinal gains without high sample requirements or sophisticated scaling processes. Notably, these analyses enable evaluators not only to consider whether or not an intervention is effective, but also, importantly, to consider who, where, and with what structural implications on the learning system [38]. In addition to reading, most of these evaluative methods will be applicable to a broad assortment of educational

interventions typified by sequential learning results, writing growth, mathematics proficiency, scientific reasoning, language acquisition, and proficiency-based curricula. Oral and dynamic evaluation models can be useful in every field of instruction where progression is characterized by mastery levels, benchmark, or any development stages. It is possible to achieve evolution of educational evaluation by turning the emphasis on average score improvement to the distribution of mobility, distributional change, and system adaptability to promote evidence-based decision-making that can help to achieve equity, effectiveness and sustained educational change [39].

4.2. Future prospect

The study should be extended in various ways in future to reinforce inference, improve the generalizability of the results and improve the knowledge in the workings. To check the strength of the detected structural shift, and to scale up to variability of effects across classroom ecologies, then, first, replication using more extensive samples across schools, grades, and regions of Peru (including rural-urban and multilingual classrooms) is required; where possible, cluster-randomized or matched quasi-experimental designs with teacher-level controls would enhance internal validity. Second, retention, delayed gains, and persistent upward ordinal mobility should be measured at longitudinal follow-ups (i.e., 3 to 6 months) after the intervention, which involves transition modeling across more than two time points to determine non-linear trends predicted by dynamic systems theory. Third, future research ought to refine by breaking down the results as per the comprehension domains (literal, inferential, and evaluative) and whether oral-tradition training facilitates higher-order skills differentially by employing parallel forms, item-level analyses as it maintains the ordinal achievement construct consistent with national norms. Fourth, an implementation research is justified to determine what elements lead to change (narrative activation, questioning routines, discussion protocols, and application tasks) and that fidelity, teacher discourse moves, and culturally specific narrative features (symbolism, moral structure, and local lexicon) mediate mobility and dominance pattern; mixed-methods designs that include classroom observations, a discourse analysis, and student interviews will help clarify the motivational and cognitive mechanisms proposed by the existing results. Lastly, methodological studies are necessary to compare ordinal mobility/dominance measures with traditional measures of means, and ordinal regression or multilevel ordinal models to develop convergent evidence, create a practical reporting standard of schools, and determine whether the mobility-entropy profile can be used as a scalable diagnostic to identify rigid versus adaptive instructional regimes across curricula other than reading (e.g., write, mathematics proficiency and scientific thinking).

5. CONCLUSION

The results of this study demonstrate that the incorporation of a culturally grounded oral tradition corpus into reading instruction can generate significant and multidimensional improvements in students' reading competence. Unlike conventional instruction, the intervention produced irreversible upward mobility across ordinal achievement levels, eliminated stagnation at lower levels of performance, and supported differentiated individual gains. Distributional, mobility, and dynamic-systems analyses further showed that the intervention reorganized reading development from a rigid and deterministic process into a flexible, progress-oriented learning system. These findings underscore the pedagogical value of culturally responsive instruction in fostering higher-order interpretive and evaluative reading skills by aligning instructional content with learners' sociocultural experiences.

To enhance the robustness and generalizability of these findings, future research should replicate this intervention with larger samples, ideally involving at least 100 students across multiple schools and classrooms. Expanding the sample size would strengthen the reliability of ordinal mobility and dominance estimates, allow for subgroup analyses (e.g., by grade level, linguistic background, or instructional context), and support more precise modeling of learning dynamics over time. Such studies would provide stronger empirical evidence for scaling culturally grounded oral tradition-based approaches within primary reading curricula and for refining system-level evaluation frameworks in literacy research. Replication with larger samples (ideally $N \geq 100$ across several schools) is recommended to confirm the stability of the observed ordinal mobility and dynamic-system patterns and to support broader generalization to Peruvian primary education contexts. These results support the use of ordinal and dynamic-system evaluation frameworks as practical tools for assessing culturally responsive instruction in primary education.

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AUTHOR CONTRIBUTIONS STATEMENT

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C : **C**onceptualization

M : **M**ethodology

So : **S**oftware

Va : **V**alidation

Fo : **F**ormal analysis

I : **I**nvestigation

R : **R**esources

D : **D**ata Curation

O : **O**riting - **O**riginal Draft

E : **E**riting - **R**eview & **E**ditng

Vi : **V**isualization

Su : **S**upervision

P : **P**roject administration

Fu : **F**unding acquisition

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

INFORMED CONSENT

We have obtained informed consent from all individuals included in this study.

ETHICAL APPROVAL

The research related to human use has been complied with all the relevant national regulations and institutional policies in accordance with the tenets of the Helsinki Declaration and has been approved by the authors' institutional review board or equivalent committee.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author, [TFVM], upon reasonable request.




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