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A Lexile-Based Analysis of Adaptive Reading Intervention Efficacy Across Proficiency Tiers in Chinese EFL Learners

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Abstract: ***This study examines the impact of integrating the Achieve 3000 (A3000) platform into the English major curriculum to bridge the gap between students' reading proficiency and the text difficulty levels of required course materials and the Test for English Majors-Band 4 (TEM4). Using a longitudinal action research design with 203 Chinese first-year English majors of different reading proficiency tiers, the study assessed reading growth within Lexile framework over one academic year. Results revealed a mean gain of 135L, while* 47.1% of students reached Textbook 2 level *yet only 1.9% of students reached TEM4 readiness (1171L), indicating persistent reading proficiency gaps despite improvement. Proficiency-stratified analysis showed differential effects: mid-tier learners (601–900L) exhibited the strongest progress after the reading intervention, while foundational learners (≤600L) demonstrated limited advancement and advanced learners (≥901L) displayed plateaued growth, suggesting the need for differentiated interventions—remedial support for lower-proficiency students and enriched challenges for advanced learners. The findings underscore A3000's efficacy in mid-proficiency ranges but highlight the necessity for tailored strategies to address varying learner needs.***

Keywords: Proficiency tiers, Lexile framework, Reading proficiency gap, Reading intervention.

1. Introduction

Developing advanced reading skills is crucial for academic success in higher education, particularly for English majors who must engage with demanding disciplinary texts and state hold examinations. However, many college students, especially those studying through English as a medium of instruction (EMI), face a significant gap between their current reading proficiency and the linguistic complexity of required course materials (Kuzborska, 2015). This discrepancy not only impedes academic progress but also negatively impacts learners' motivation and self-efficacy (Grabe & Stoller, 2013). To bridge this gap, scholars emphasize the importance of selecting texts that are "not too easy, not too difficult, but just right" (McNamara et al., 2014, p. 9). However, traditional teaching methods often fail to provide personalized, adaptive support tailored to individual learners' needs. In this context, technology-enhanced reading platforms, such as the Achieve 3000 (A3000) graded reading system, offer a promising solution. By leveraging Lexile-based adaptive algorithms, A3000 delivers level-appropriate texts and structured exercises (pre-reading, comprehension tasks, post-reading reflection, and writing practice), thereby enhancing vocabulary retention, reading efficiency, and content knowledge (Zhang, 2023) and critical reading ability (Zhao & Fu, 2021) as well as improving the likelihood of the student passing state hold examinations (Reeves, 2014). In addition, A3000 provides data of students' current reading proficiency levels and actual reading behavior, which is essential to gain a comprehensive understanding of Chinese students' current reading proficiency levels, so as to provide data-driven support for establishing reading competency goals and standards (Cheng & Chen, 2019). To gain more insight into the effectiveness of A3000 on bridging the proficiency gap challenge and improving overall reading ability, the present study was carried out to specifically investigate if integrating A3000 into reading activities has any effects on Chinese university English learners' reading competence, and which tiered group benefits the most from this integration.

2. Literature Review

2.1 The Lexile Framework for Reading

The Lexile Framework for Reading represents a scientifically validated approach to text measurement and reader assessment, providing a unified metric system that quantifies both reading ability and text difficulty on the same scale (Lennon & Burdick, 2004). At its core, a student's Lexile measure indicates the level at which they can comprehend approximately 75% of the material, a carefully calibrated balance that maintains reading as both an achievable and challenging activity (Lennon & Burdick, 2004). This 75% comprehension threshold, grounded in Vygotsky's (1978) zone of proximal development, optimizes the learning process by ensuring texts are sufficiently challenging to promote growth while remaining accessible enough to sustain motivation.

From a pedagogical perspective, the Lexile Framework offers significant advantages for both learners and educators. For students, the system addresses two critical factors in reading engagement: text interest and age appropriateness (Lennon & Burdick, 2004). By matching readers with materials that are neither developmentally immature nor excessively advanced, the framework helps maintain optimal engagement levels. For instructors, Lexile measures provide an objective, common scale that facilitates differentiated instruction and progress monitoring across curricula (Lennon & Burdick, 2004). This quantitative approach enables educators to make data-informed decisions when selecting instructional materials.

Research suggests that text selection should be strategically adapted to learning contexts: when addressing complex or unfamiliar topics, instructors may opt for texts at or below a

student's measured Lexile level to reduce cognitive load; conversely, when adequate instructional support is available (e.g., vocabulary pre-teaching, guided discussions), more challenging texts can be introduced to stimulate development (Lennon & Burdick, 2004). This flexibility highlights the importance of teacher mediation in maximizing the framework's educational potential. Shi and Jin's (2024) Lexile-based reading intervention with EAP students tends to raise their reading ability towards a desired standard. However, they failed to identify which learner subgroups benefited most (e.g., low vs. high baseline proficiency), or how effective the interventions bridge the gap between the students' reading ability and required reading materials.

2.2 Achieve 3000 and Reading Ability

The Achieve 3000 platform (A3000), grounded in the scientifically validated Lexile framework for reading (Lennon & Burdick, 2004) and differentiated instruction theory (Tomlinson, 2014), represents an innovative approach to adaptive English reading instruction. This web-based system utilizes students' initial Lexile assessments to deliver personalized reading materials through a structured five-phase learning cycle: pre-reading reflection, article study, comprehension exercises, post-reading critical thinking, and writing practice. This design operationalizes Vygotsky's (1978) zone of proximal development through its proprietary algorithm, which dynamically adjusts text complexity while maintaining an optimal 75% comprehension threshold (MetaMetrics, 2020).

Empirical evidence demonstrates its effectiveness in enhancing multiple dimensions of reading competence of different learners. Large-scale implementation research by Reeves (2014) with 4,340 tenth-grade participants across 17 high schools revealed a crucial effect: students completing ≥5 activities showed markedly better outcomes than sporadic users, highlighting the importance of implementation fidelity. Subsequent studies have confirmed this implementation-dependent pattern, showing A3000's dual impact on both foundational skills such as vocabulary acquisition and reading strategy repertoire (Zhang, 2023) and high-stakes assessment performance (Zhao & Fu, 2021). Beyond learner outcomes, the platform transforms instructional dynamics by providing real-time performance data that enables evidence-based pedagogical adjustments. Comparative studies show A3000-based courses outperform traditional instruction across multiple metrics: 85% of students report more positive learning experiences, 78% provide favorable feedback on the adaptive methodology, and longitudinal data show 22% higher course persistence rates (Zhang, 2023).

However, existing research exhibits methodological gaps. While Zhao and Fu (2019) observed generalized improvements in critical reading among 100 mixed-major freshmen, their action study lacked granular analysis of differential effects across proficiency levels. Similarly, Zhang (2023) concluded that through personalized reading and writing customization solutions, students' English reading literacy has been effectively improved and the teaching quality and level of English courses have also been improved accordingly, but the teaching effectiveness was not differentiated among students' reading proficiency. These limitations underscore the need for more nuanced investigations into how A3000 interact with learner variables to optimize reading outcomes. Consequently, to investigate whether the integration of A3000 in reading class can bridge the gap between students' reading ability and the requirement of state examination and the teaching course books and how it impacts differently on student group, the researcher proposed the following research questions for the present investigation:

RQ1: To what extent does incorporating A3000 into the English major curriculum help bridge the identified gaps between students' current reading and the text difficulty levels of TEM4 and required course books?

RQ2: Does the A3000 platform differentially impact students with varying baseline reading proficiency levels? If so, which specific subgroup demonstrate significant improvement?

3. Methodology

3.1 Participants

The study involved 224 first-year undergraduate students, majoring in English Language and Literature at a university in Northwest China, who participated in a blended "online + offline" Comprehensive English course. All participants were L2 English learners with a minimum of six years of secondary English education. Their average score on the National College Entrance Examination (Gaokao) English test was 110 (out of 150), indicating intermediate English proficiency. These students were preparing to take the nationwide standardized Test for English Majors-Band 4 (TEM4) in their second year. The year-long course spanned two semesters with a total of 132 class hours. All participants completed the initial Lexile reading assessment (pre-test) at the beginning of the first semester and a midterm assessment at the end of the first semester. A subset of 206 students completed the final post-test at the end of the second semester, providing longitudinal data on reading proficiency development. From the initial cohort of 206 participants, 19 students (9.22%) demonstrated negative Lexile growth ranging from -10L to -410L. Through structured individual interviews with all 19 cases, we identified three extreme outliers (-410L and two instances of -170L) whose score variations were conclusively attributed to extraneous factors (testing irregularities or personal circumstances) rather than instructional intervention effects. Following established protocols for handling influential outliers, these cases were excluded to maintain data integrity. Consequently, the final analytical sample comprised 203 valid cases, representing 98.54% of the original dataset.

3.2 Method

This research first uses the Lexile Analyzer to measure quantitatively the participants' English reading ability compared to the readability of their required reading texts from both course books and TEM4. Within an action research design, one-year long data were collected from Year 1 students. The baseline value concerning reading gaps was ascertained (for RQ1), and after conducting reading interventions designed to narrow ascertained gaps by

integrating A3000 into reading activities, the effect of action research was clarified (for RQ2).

3.3 Procedure

A four-step research plan addressed the research questions. The first step was a needs analysis to ascertain the gap between students reading ability and the requirements of either course books or TEM4. The second step monitored the intervention whereby A3000 was integrated into inside- and outside-class reading activities during the action research. The third step examined the effect of using A3000 by a mid-test and adjusted the action research accordingly. The forth step examined the result of using A3000 by a post-test and analyzed the potential factors leading to the result.

4. Results and Discussion

4.1 To What Extent Does Incorporating A3000 into the English Major Curriculum Help Bridge the Identified Gaps between Students' Current Reading and the Text Difficulty Levels of Required Course Books and TEM4?

4.1.1 Lexile measure results of the course books and TEM4

The Lexile analysis revealed a substantial discrepancy between the difficulty levels of required course materials and the academic reading demands of the TEM4 examination. As illustrated in Table 1, the 12 TEM4 reading passages (2019-2023) measured at 1076L-1266L, significantly exceeding the Lexile ranges of the prescribed textbooks (Testbook 1: 710L-910L; Testbook 2: 810L-1000L). This 166L-556L gap suggests that the textbooks' text complexity fails to prepare students for the cognitive-linguistic challenges of TEM4, potentially explaining the documented struggles in academic reading transitions (Kuzborska, 2015), even though there is a roughly 200L inter-textbook progression, which demonstrates intentional grading but remains insufficient to bridge students to the above 1100L+ threshold required for standardized testing.

Table 1: Lexile text measure results of TEM4 and course books

Source	Lexile Range	Number of Texts	Word Count per Text	Word Count
TEM 4	1076L-1266L	12	612	7346
Textbook1-Y1S1	710L-910L	12	1413	16960
Textbook2-Y1S2	810L-1000L	12	1625	17883

TEM4=Test for English Majors-Band 4
Y1S1=Year 1 Semester 1; Y2S2=Year 1 Semester 2

4.1.2 The gap of students' reading ability and the requirement of course books and TEM4

The Lexile measure analysis (N=203) reveals a significant progression in text difficulty across the curriculum materials, yet highlights persistent gaps with standardized testing demands. As depicted in Figure 1, students' initial reading proficiency (Mean Lexile: 758L) substantially lagged behind the required textbook levels, indicating a foundational preparedness deficit at program entry. First-year course books may inadequately bridge secondary-to-tertiary reading demands, corroborating Kuzborska's (2015) findings on L2 transition challenges. The observed deficit necessitates either upward revision of later-semester textbook Lexiles, or integrated adaptive platforms like A3000 to provide graduated exposure to academic-level texts.

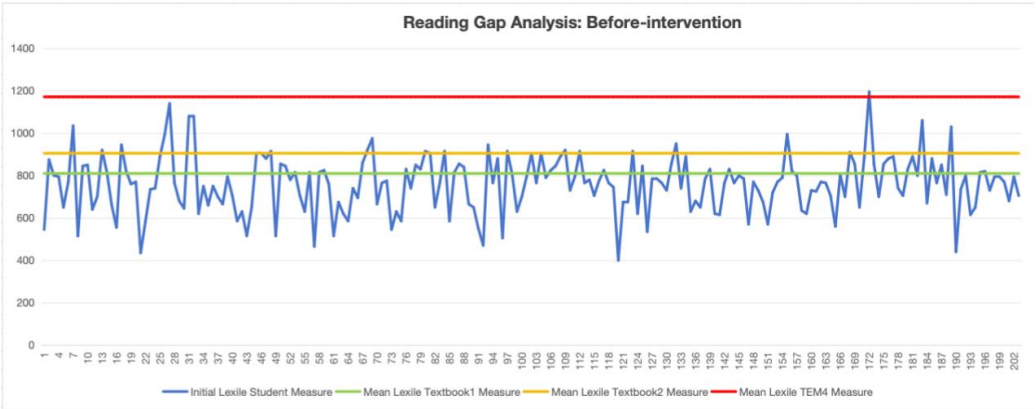

Figure 1: Reading Gap Analysis: Baseline

4.1.3 The extent of incorporating A3000 into the English major curriculum to bridge the identified gaps

The longitudinal Lexile analysis reveals both encouraging progress and persistent challenges in students' reading development (Figure 2). As shown in the figure, students' final reading levels (Lexile Student Measure Final) demonstrate measurable improvement from baseline, representing a 135 L gain. The final student measures (893L) show 47.1% of students reached Textbook 2 level, but only 1.9% approached TEM4 readiness, suggesting current instruction may be more effective at building foundational than academic reading skills. This analysis aligns with Vygotsky's (1978) zone of proximal development, suggesting the current curriculum provides appropriate challenge but requires additional scaffolding for assessment readiness. The maintained hierarchy (Textbook1 < Textbook2 < Student Final < TEM4) suggests the curriculum follows logical sequencing but requires acceleration. The remaining 278 L difference between final student levels and TEM4 requirements indicates the need for either enhanced high-level reading modules in later semesters or earlier integration of discipline-specific academic texts. These results empirically validate the "proficiency ceiling" phenomenon in L2 reading development (Grabe, 2009), while highlighting the need for targeted interventions during the critical second year when students prepare for TEM4.

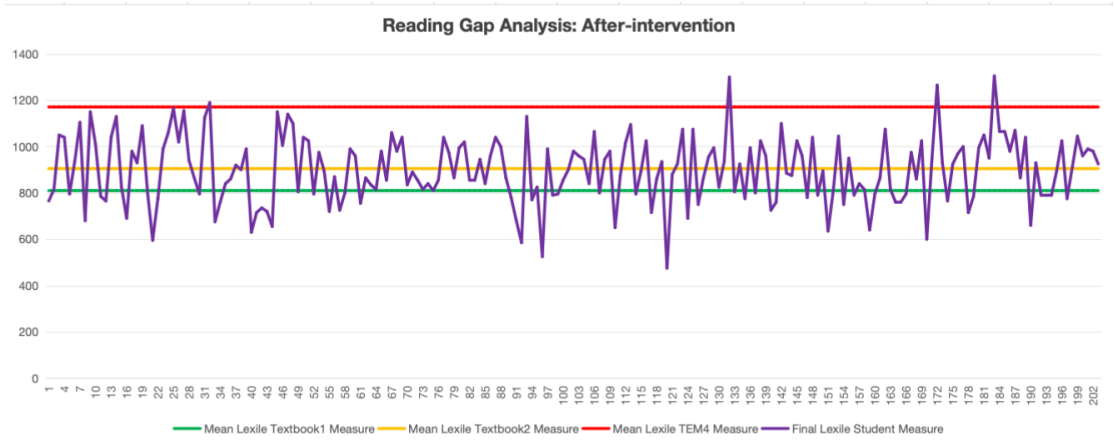

Figure 2: Reading Gap Analysis: Progression

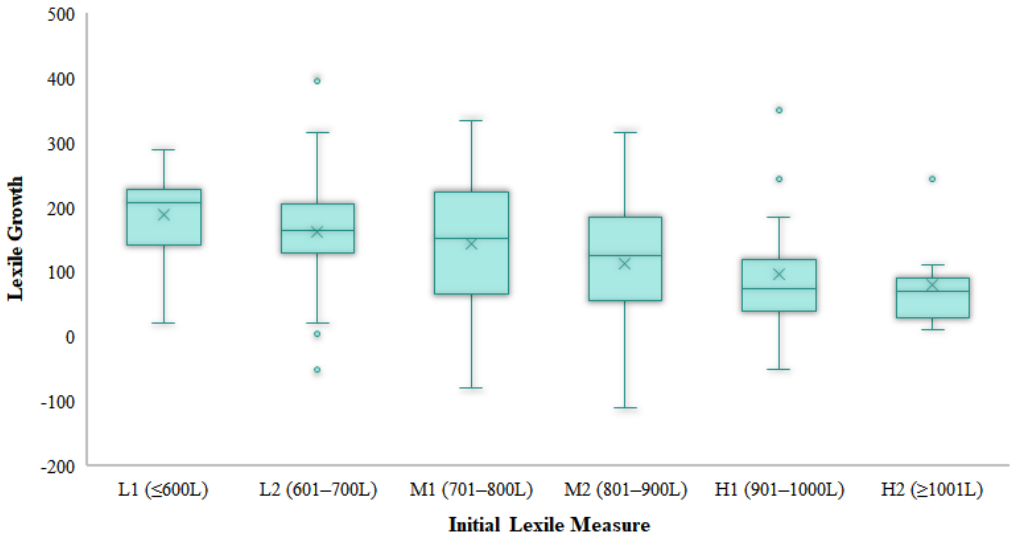

Figure 3: Distribution of Participants Across Lexile Proficiency Tiers

4.2 RQ2: Does the Achieve 3000 Platform Differentially Impact Students with Varying Baseline Reading Proficiency Levels? If So, Which Specific Subgroup Demonstrate Significant Improvement?

To systematically analyze differential learning outcomes, participants were stratified into six proficiency groups based on their initial Lexile scores. L/M/H denotes Low/Medium/High proficiency bands.

- L1 (Foundational Level): ≤600L
- L2 (Emerging Proficiency): 601–700L
- M1 (Intermediate I): 701–800L
- M2 (Intermediate II): 801–900L
- H1 (Advanced I): 901–1000L
- H2 (Advanced II): ≥1001L

This tiered classification follows established Lexile benchmarking for L2 learners (MetaMetrics, 2020) and enables granular examination of how intervention effects vary across. Figure 3 presents the distribution of Lexile growth values across different initial Lexile proficiency groups using boxplots, revealing a clear pattern of differential improvement through the A3000 intervention.

L1 (≤600L) students demonstrated the highest median growth (315L), with wide interquartile range (IQR), indicating highly variable outcomes: while median growth was substantial (~200L), the lower whisker shows some students made minimal progress, suggesting this group may require differentiated support strategies. L2 (601-700L) demonstrated consistent improvement, with a tight IQR and median growth of ~180L, suggesting the intervention was particularly well-calibrated for this proficiency range. M1-M2 (701-900L) showed moderate but stable growth (median ~150L), with M2 displaying less variability than M1, indicating a consolidation phase in reading development. H1-H2 (≥901L) revealed constrained growth (median ~120L) with several outlier students in H1 achieving exceptional gains.

The transition matrix (Table 2) reveals distinct patterns in Lexile progression across proficiency tiers (N=203). Overall, 95.07% of students exhibited stable or improved Lexile scores, with significant upward mobility observed in intermediate tiers. M1 (701–800L) served as the primary transition hub, absorbing 32.51% of participants. 20 students (9.85%) advanced to M2 (801–900L), marking the largest single-tier progression, while 18 students (8.87%) progressed to H1 (901–1000L), and 14 (6.90%) reached H2 (≥1001L). M2 (801–900L) showed notable advancement, with 16 students (7.89%) progressing to H1. Among L2 (601–700L), 15 students (7.39%) advanced to M1, demonstrating effective intervention responsiveness. For advanced learners (H1: 901-1000L), however, limited progression (5.42% to H2)

aligns with the "plateau effect" in language acquisition, suggesting the need for cross-disciplinary complex tasks. For foundational learners (L1: ≤600L), only 9 students (4.43%) reached M1, indicating a critical need for intensive remediation modules. These results confirm the intervention's strongest efficacy for mid-proficiency learners (601–900L), consistent with Vygotsky's Zone of Proximal Development (ZPD) theory, while underscoring the necessity for differentiated strategies addressing both foundational and advanced learners: foundational learners (L1) may require more intensive support, while advanced students (H1-H2) might benefit from supplemental challenge materials.

Table 2: Lexile Proficiency Tier Migration Patterns Post-Intervention

		Initial Lexile Measure						
		L1(≤600L)	L2 (601–700L)	M1 (701–800L)	M2 (801–900L)	H1 (901–1000L)	H2 (≥1001L)	Total
Final Lexile Measure	L1(≤600L)	**4(1.97%)**	1(0.49%)	0(0%)	0(0%)	0(0%)	0(0%)	5(2.46%)
	L2 (601–700L)	**5(2.46%)**	**4(1.97%)**	2(0.99%)	0(0%)	0(0%)	0(0%)	11(5.42%)
	M1 (701–800L)	**9(4.43%)**	**15(7.39%)**	**12(5.91%)**	6(2.96%)	0(0%)	0(0%)	42(20.69%)
	M2 (801–900L)	**5(2.46%)**	**15(7.39%)**	**20(9.85%)**	**7(3.45%)**	1(0.49%)	0(0%)	48(23.64%)
	H1 (901–1000L)	**0(0%)**	**5(2.46%)**	**18(8.87%)**	**16(7.89%)**	**9(4.43%)**	0(0%)	48(23.65%)
	H2 (≥1001L)	**0(0%)**	**1(0.49%)**	**14(6.90%)**	**16(7.89%)**	**11(5.42%)**	**7(3.45%)**	49(24.14%)
	Total	23(11.33%)	41(20.20%)	66(32.51%)	45(22.17%)	21(10.34%)	7(3.45%)	203(100.00%)

5. Conclusion

This study yields two key findings regarding A3000's role in bridging L2 reading gaps. First, while the platform facilitated significant Lexile growth (135L mean gain), 47.1% of students reached Textbook 2 level yet only 1.9% of students reached test readiness for TEM4. Second, intervention efficacy varied markedly by proficiency, with the intervention demonstrating strongest efficacy for mid-proficiency learners (601–900L). M1 (701–800L) emerged as the primary transition hub, facilitating significant upward mobility, while L2 (601–700L) and M2 (801–900L) also showed notable progression, aligning with Vygotsky's Zone of Proximal Development (ZPD) theory. However, foundational learners (L1: ≤600L) exhibited limited advancement, underscoring the need for intensive remediation, whereas advanced learners (H1-H2: ≥901L) displayed constrained growth, reflecting a plateau effect that may require cross-disciplinary challenges. These findings highlight the necessity for differentiated instructional strategies—targeted support for lower-proficiency students and enriched materials for advanced learners—to optimize reading development across all tiers. Future research should investigate hybrid models combining A3000 with discipline-specific reading scaffolds.

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Project: The 18th Undergraduate Teaching Reform Research Project of Baoji University of Arts and Sciences: Research on the Evaluation Model and Development Path of Pre-service Teachers' Information Literacy (23JGYB29)

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