



# A Comprehensive Analysis of Youth Chinese Test Vocabulary Size and Gamification Strategies for Elementary Students

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## Abstract

In an era of globalization and increasing cultural exchange between nations, a large number of foreign language learners have turned proficiency in Mandarin into a vital skill that provides individuals with opportunities to enhance communication, cultural understanding, and international cooperation. Simultaneously, China's growing economic influence and its pivotal role in global affairs further highlight the promising prospects for Chinese language acquisition. In this context, this study adopts the method of random sampling to assess the Youth Chinese Test (hereafter referred to as YCT) vocabulary of 30 first-year students from different language backgrounds at a private school in Chiang Mai, Thailand. Meanwhile, semi-structured interviews with 10 experienced Chinese teachers using the method of purposive sampling are employed to further strengthen the research findings and capture their views on integrating gamification technology into Chinese language teaching. The findings, which reveal a clear gap between the vocabulary of Thai primary school students and the expected YCT standards, as well as feasible gamification strategies to address these issues, have prompted Mandarin educators to re-evaluate current Mandarin teaching methods. This study advocates the integration of gamification strategies in Mandarin teaching in primary schools to promote vocabulary acquisition and student participation. By elucidating the benefits of Mandarin proficiency in a global context and providing actionable recommendations for Mandarin teaching improvement, this study contributes to the ongoing discussion on language education and intercultural competency development.

**Keywords:** gamification, elementary education, Youth Chinese Test, Mandarin proficiency

## 1. Introduction

Mastering Mandarin serves as a key for foreign language learners to unlock the promotion of Asian cultural communication, not to mention the huge economic influence of China in the world nowadays (Sukjairungwattana, 2023). As far as we know, there are more than 1.3 billion Chinese native speakers on mainland China. Based on this huge population base,

Mandarin becomes the most spoken language in Asia. Mastering Mandarin not only helps people obtain a variety of personal and professional opportunities but also helps them reach a wider international market.

In the learning and teaching process of second or foreign language acquisition (L2), vocabulary expansion is a cornerstone of language acquisition and a pain point for many language teachers and students. As far as current language education is concerned, traditional methods such as direct teaching and rote learning are often considered insufficient to support the expansion of a broad vocabulary to achieve language fluency (Uchihara & Yanagisawa, 2019; Karami & Powers, 2019). In this case, complementary activities such as immersive storytelling, interactive games, and the use of visual aids have become an indispensable part of vocabulary enrichment programs (Peters & Webb, 2018).

It is worth noting that playing games and incidentally acquiring words in language learning is considered an enjoyable way to increase vocabulary and can be used effectively to expand implicit and explicit vocabulary (Noroozi et al., 2016). The process of using game design concepts, strategies, and features to make learning activities more participatory, entertaining, and immersive is called "gamification." The essence of gamification teaching is to improve language learners' learning motivation and outcomes by applying game elements and mechanisms to non-game environments (Anisa et al., 2020). For instance, the gamification of language learning assignments enables students to interact meaningfully in a simulated environment and use language skills in a real environment. At the same time, language educators can improve engagement and learning effectiveness by integrating vocabulary exercises into game mechanics and using learners' intrinsic motivation to achieve goals and progress.

Gamification emphasizes the reasonable integration of entertainment, competition, and other elements with teaching (Munday, 2016) and is well-known and widely recognized for its capacity to inject entertainment and engagement elements into the learning environment (Nahmod, 2017). It provides an engaging and dynamic educational experience for learners by strategically integrating game ideas into non-game contexts. (Baptista & Oliveira, 2018; Werbach & Hunter, 2015).

The Youth Chinese Test (YCT), on the other hand, is an internationally recognized standardized test designed to assess Chinese language proficiency, primarily for foreign students attending primary and secondary schools. In addition to serving as a benchmark for students taking the HSK, the YCT includes four different proficiency levels, each made up of reading, writing, speaking, and listening skills. Among them, the YCT Level 1 test requires the mastery of 80 words, the Level 2 test requires the mastery of 150 words (equivalent to HSK Level 1), the Level 3 test requires the mastery of 300 words (equivalent to HSK Level 2), and the Level 4 test requires the mastery of 600 words (equivalent to HSK Level 3).

For Primary 1 students in Thailand, reaching YCT Level 2 (equivalent to HSK Level 1) in Mandarin has many practical advantages. It promotes better contact between learners and Chinese-speaking classmates and teachers and enhances the learning experience in a multicultural educational environment. In addition, early Mandarin skills can lay a solid foundation for future language acquisition, paving the way to advanced proficiency. Overall, reaching YCT Level 2 in Mandarin promotes personal growth and broadens academic and extracurricular horizons for Thai primary 1 students.

Figure 1: YCT proficiency compared to other systems

HSK	HSKK	BCT	YCT	Vocabulary	CEF	ILR	CLPS
HSK Level 6	HSKK (Adv.)	BCT (B)		Over 5,000	C2	4/4+	Grade V
HSK Level 5				2500	C1	3/3+	Grade V
HSK Level 4	HSKK (Interm.)			1200	B2	2/2+	Grade IV
HSK Level 3		BCT (A)	YCT Level 4	600	B1	1+	Grade III
HSK Level 2	HSKK (Basic)		YCT Level 3	300	A2	1	Grade II
HSK Level 1			YCT Level 2	150	A1	0/0+	Grade I
			YCT Level 1	80			

There is currently a dearth of research on the application of gamification to promote elementary students' Mandarin vocabulary acquisition, despite the present explosion of studies on gamified teaching strategies. In an effort to close this gap, this research endeavours to advance understanding and practice in the domain of Mandarin education in Thailand, with a focus on assessing students' Mandarin vocabulary acquisition. The study is guided by two specific objectives:

1. To assess the baseline YCT (Youth Chinese Test) vocabulary proficiency of Thai elementary students prior to gamified learning interventions.
2. To investigate the perceptions and perspectives of experienced Chinese language instructors regarding the efficacy and utility of gamification techniques in YCT vocabulary instruction.

## 2. Methods

### 2.1 Participants and Context

Thirty first-year students from a private school in Thailand were randomly selected to participate in this study. The participants were selected to represent different socioeconomic backgrounds and Mandarin proficiency. The study included students who were actively learning Mandarin in Year 1, excluding those who had previously taken YCT Level 2 or had significant language or developmental challenges. In addition, three experienced Chinese teachers conduct YCT vocabulary tests in a controlled classroom environment, following standardized procedures. Demographic information, including age, gender, and previous Mandarin exposure, was collected to support the analysis. Obtain consent from a parent or guardian to ensure ethical standards and protect the privacy of participants.

Meanwhile, the study involved ten highly experienced Chinese language educators, each possessing over a decade of pedagogical expertise, purposefully selected to provide comprehensive insights into their attitudes toward the integration of gamification strategies in teaching Chinese vocabulary and preparing students for the Youth Chinese Test (YCT). Employing semi-structured interviews guided by a meticulously designed 10-question interview guide, the research explores the nuanced perspectives and methodological approaches of these educators. The recruitment of participants is conducted with careful consideration of their extensive professional backgrounds, ensuring the richness and depth of insights obtained. Individual interviews are conducted flexibly, utilizing audio recording methods and subsequent verbatim transcription to ensure fidelity to participants' responses.

The interview questions were rigorously evaluated using Item-Objective Congruence (IOC) forms, assessed by three Mandarin language experts. The resulting index exceeded the acceptable threshold of 0.80, thereby demonstrating a high level of reliability and trustworthiness in the instrument's design.

Table 1: Semi-structured interview questions based on YCT framework

No	Topic	Interview Question
Q1	General Teaching Approach	How would you describe your overall teaching approach when it comes to preparing students for the YCT exams?
Q2	YCT Exam Alignment	In your experience, how do you ensure that your teaching methods align with the YCT framework, particularly in terms of language proficiency levels and content relevance?
Q3	Use of Gamification	Have you integrated gamification techniques into your Chinese language classes, specifically for teaching vocabulary? If so, could you provide examples of successful activities or strategies?
Q4	Student Engagement	What role do you believe gamification plays in engaging students and enhancing their motivation to learn Chinese vocabulary, especially in the context of YCT preparation?
Q5	Challenges and Solutions	Can you share any challenges you've encountered in using gamification methods for teaching Chinese vocabulary, and how have you addressed or overcome these challenges?
Q6	Effectiveness Assessment	How do you assess the effectiveness of gamification in helping students acquire and retain Chinese vocabulary knowledge for the YCT exams?
Q7	Student Feedback	Have you gathered feedback from students regarding their experiences with gamified approaches to learning Chinese? What insights have you gained from their perspectives?
Q8	Adaptation for Diverse Learners	How do you tailor gamification techniques to accommodate diverse learning styles and aptitudes within your Chinese language classes, particularly considering the YCT framework?
Q9	Suggestions for Improvement	Based on your experience, what suggestions or recommendations do you have for other Chinese teachers looking to incorporate gamification into their vocabulary teaching methods for YCT preparation?
Q10	Future Trends and Innovations	Considering the evolving landscape of education and language teaching, where do you see opportunities for further innovation and improvement in teaching Chinese vocabulary, especially in the context of YCT exams?

## 2.2 Research Tools

In the study involving elementary students, the primary research instrument employed was the Youth Chinese Test (YCT) vocabulary test, specifically aligned with YCT Level 2 standards. Prior to administration, the test items were rigorously evaluated by three Mandarin language experts to ensure validity and reliability. This standardized assessment was then meticulously administered by three experienced Chinese language educators within a controlled classroom environment. Furthermore, comprehensive demographic data, including age, gender, and prior exposure to Mandarin, was systematically collected to provide context for subsequent data analysis.

In the study involving Chinese language educators, semi-structured interviews served as the primary research tool. A 10-question interview guide, thoughtfully designed to elicit nuanced perspectives on gamification strategies in teaching Chinese vocabulary and YCT test preparation, facilitated an in-depth exploration of educators' attitudes and methodologies. The interview questions were evaluated using Item-Objective Congruence (IOC) forms assessed

by three experts to ensure reliability. Thematic analysis was employed to identify recurring themes, patterns, and variations in educators' responses, thereby enhancing our understanding of their pedagogical strategies.

### **2.3 Data Collection Procedure**

The data collection process for elementary students began with the random sampling of thirty grade 1 students enrolled in Mandarin language classes at a private school in Chiang Mai, Thailand. Informed consent was obtained from parental or guardian authorities prior to participation. The YCT vocabulary test was then administered by three experienced Chinese language educators, ensuring adherence to standardized protocols and procedures. Demographic data was collected alongside the test to provide contextual information for subsequent analysis.

For Chinese language educators, ten participants with extensive pedagogical experience were purposefully selected for semi-structured interviews. Each interview was conducted on-site individually over a 20-minute period. Informed consent was obtained before the semi-structured interview, and interviews were conducted flexibly with audio recording and verbatim transcription to ensure accuracy. Thematic analysis was employed to extract meaningful insights from the interview data.

### **2.4 Data Analysis**

Quantitative data from the YCT vocabulary test was analyzed using statistical methods to determine students' proficiency levels. Descriptive statistics such as mean scores and standard deviations were calculated using the Statistical Package for Social Science to assess vocabulary acquisition and identify any trends or patterns.

Qualitative data from the semi-structured interviews with Chinese language educators was analyzed using thematic analysis. Through a systematic process of coding and categorization, recurring themes, patterns, and variations in educators' attitudes and methodologies were identified, providing rich insights into the integration of gamification strategies in language teaching. Ethical considerations, including confidentiality and respect for autonomy, were rigorously maintained throughout the data analysis process.

## **3. Results and Discussion**

### **3.1 Result of YCT Vocabulary Assessment**

Table 2 shows that the analysis of vocabulary acquisition among thirty grade 1 students reveals a mean vocabulary size of 105.17 words ( $SD = 16.48$ ). Comparing this to the Youth Chinese Test (YCT) level 2 benchmark of 150 words, the data highlights a significant disparity, indicating that students, on average, have not yet reached the expected proficiency level. Moreover, the dataset encompasses a range of scores, with the highest vocabulary size recorded at 138 words and the lowest at 78 words, illustrating the variability in individual students' linguistic proficiency within the cohort.

Table 2: YCT Vocabulary Test Result

Student ID	YCT Vocabulary Size (Mean: 105.17, SD: 16.48)	Nouns Accuracy (%)	Verb Accuracy (%)	Adjectives Accuracy (%)	Pronounce Accuracy (%)	Numerals Accuracy (%)
S001	108	80	72	69	85	87
S002	96	67	63	59	75	78
S003	89	61	55	53	66	69
S004	138	91	86	82	95	98
S005	112	76	71	66	81	86
S006	126	87	81	76	92	94
S007	78	51	45	42	58	61
S008	99	68	65	61	76	79
S009	93	64	58	56	71	73
S010	105	73	69	64	82	84
S011	124	81	74	72	88	90
S012	116	78	72	68	83	85
S013	83	53	49	45	62	65
S014	133	86	80	75	91	93
S015	119	79	73	69	84	88
S016	101	70	66	62	78	81
S017	110	75	71	67	80	85
S018	92	62	57	54	68	72
S019	97	66	61	60	74	77
S020	107	74	70	65	81	83
S021	113	77	72	68	82	86
S022	122	83	76	70	85	89
S023	95	65	60	57	73	76
S024	84	54	50	47	63	66
S025	127	88	82	77	93	96
S026	117	80	75	70	85	89
S027	111	76	71	68	81	87
S028	104	72	68	64	80	82
S029	99	68	64	60	76	79
S030	115	78	73	67	83	87

Table 3 illustrates that nouns exhibit a mean accuracy rate of 72.73%, with a standard deviation of 10.18. Verbs demonstrate a slightly lower mean accuracy rate of 67.73%, with a standard deviation of 10.21. Adjectives show a further decrease in mean accuracy, averaging at 63.17% with a standard deviation of 10.82. Pronouns, on the other hand, exhibit a higher mean accuracy rate of 77.47%, with a standard deviation of 11.89. Numerals display the highest mean accuracy rate among all word types, at 82.17% with a standard deviation of 10.96. The findings provide insights into students' proficiency levels across different word types, with numerals being the most accurately recognized and adjectives showing the lowest accuracy rate. Based on the data analysis, it appears that adjectives are the most challenging word type to master, with an average accuracy rate of 63.17% and a standard deviation of 10.82, indicating relatively lower recognition accuracy. Conversely, numerals emerge as the easiest word type to grasp, boasting the highest mean accuracy rate of 82.17% with a standard deviation of 10.96.

Table 3: YCT Vocabulary Accuracy Based on Word Category

Word Category	Mean Accuracy (%)	Standard Deviations
Nouns	72.73	10.18
Verbs	67.73	10.21
Adjectives	63.17	10.82
Pronouns	77.47	11.89
Numerals	82.17	10.96

### 3.2 Result of Semi-structured Interview

According to Table 4, the data on Chinese language teachers' attitudes toward gamification strategies in vocabulary instruction reveal a spectrum of perspectives independent of teaching experience. Teachers with positive attitudes toward gamification, such as T001 and T003, with 15 and 14 years of experience, respectively, incorporate interactive methodologies including game-based learning, role-playing activities, and gamified assessments. These educators recognize the potential of gamification to enhance student engagement and learning outcomes. Conversely, teachers with neutral or negative stances, such as T004 and T008, who possess 11 and 17 years of experience respectively, predominantly employ traditional instructional methods. These methods include direct instruction, rote memorization, and grammar drills, supplemented occasionally with technology or multimedia presentations.

Table 4: Experienced Mandarin Teachers' Attitudes toward Gamification and Teaching Strategies

Teacher ID	Years of Teaching Experience	Attitude towards Gamification	Teaching Strategy Adopted
T001	15 years	Positive	Game-based learning, interactive quizzes
T002	12 years	Neutral	Traditional methods with technology
T003	14 years	Positive	Role-playing activities, gamified assessments
T004	11 years	Negative	Direct instruction, focus on rote memorization
T005	13 years	Positive	Gamified vocabulary drills, storytelling
T006	10 years	Neutral	Blended learning approach, occasional games
T007	10 years	Positive	Interactive simulations, competitive quizzes
T008	17 years	Negative	Lecture-based, grammar drills
T009	16 years	Positive	Collaborative projects, gamified quizzes
T010	13 years	Neutral	Multimedia presentations, group discussions

### 3.3 Result of Thematic Analysis

Teaching Methods and Alignment with YCT Framework:

*T 001: Well, I believe in sticking to the book, you know? The YCT exam is pretty standard, so I make sure my teaching methods are in line with its framework. It's all about covering the vocabulary and grammar the exam expects, nothing too fancy.*

Gamification in Chinese Curriculum:

*T 007: Now, here's where things get interesting. I've been incorporating some gamification into my classes, especially for vocabulary teaching. I found that the word card competitions, both team and individual battles, really get the kids excited. It's a fun way to make sure they're actually learning those words.*

Impact of Gamification on Student Engagement:

*T 003: Oh, it's been great! The games really liven up the class. You can see the kids are much more engaged when we're playing these games. It takes away the boredom of just*

*memorizing words, you know? And the competitive aspect? That just adds another layer of excitement.*

#### Challenges and Solutions in Gamification:

*T 010: Sure, there have been some challenges, especially with managing the class during team battles. It can get pretty chaotic with only one teacher. So, I've started doing smaller group battles and individual competitions to keep things under control. It seems to be working out better.*

#### Evaluation of Gamified Chinese Courses:

*T 007: Well, I mostly look at how the kids do in the exams. We have mock exams at different stages, and I use those results to see if the gamified courses are actually helping them learn better. It's all about the numbers, you know?*

*T 004: Absolutely, exam results are a good indicator of how effective our teaching methods are. But I also like to get feedback from the students to see if they're enjoying the games and finding them helpful.*

#### Student Feedback and Insights:

*T 005: Most of the kids seem to enjoy the gamification. They're more willing to learn Chinese when it's presented in a fun way. But they've also mentioned how important it is to make sure everyone feels included, not just the ones who win the games.*

#### Adapting Gamification for Different Learning Styles:

*T001: Yeah, I try to mix things up based on what the kids like. Some prefer physical cards, while others are more into virtual ones. And I make sure the difficulty level of the games matches each student's learning abilities while still covering what they need for the YCT.*

### 3.4 Discussion

Through the analysis of the vocabulary acquisition of 30 first-year students, it is found that the average vocabulary is 105.17 words, significantly lower than the Young Chinese Test (YCT) level 2 benchmark of 150 words, indicating that the average student has not reached the expected proficiency level. This finding aligns with previous research, which has shown that early-stage language learners often struggle to meet benchmark vocabulary requirements, highlighting the need for targeted interventions (Nation, 2013; Milton, 2009). The vocabulary size ranges from 138 to 78, highlighting differences in language proficiency and indicating the need for differentiated teaching strategies. These variations in vocabulary size are consistent with studies that emphasize the diverse learning paces among students, necessitating tailored instructional approaches (Schmitt, 2010). Among them, the accuracy of nouns, verbs, and adjectives is 72.73%, 67.73%, and 63.17%, respectively; the accuracy of pronouns and numerals is higher, at 77.47% and 82.17%. This suggests that the specific nature of number words makes it easier for students to memorize, a finding supported by the notion that frequency and concreteness of vocabulary items enhance retention (Ellis & Beaton, 1993; Nation, 2013). This also suggests that more attention needs to be paid to teaching adjective comprehension, an area often identified as challenging due to its abstract nature (Schmitt, 2010; Plass et al., 2015). Teachers have different attitudes towards gamification in vocabulary teaching. Some educators (such as T001 and T003) adopt a game-based approach to learning, reporting increased enthusiasm and improved motivation among students (Figuroa-Flores, 2016), while others (such as T004 and T008) prefer a more traditional approach, emphasizing the need for professional development to demonstrate the effectiveness of gamification (Hamari et al., 2014; Deterding et al., 2011). This mixed

reception of gamification is in line with findings by Deterding et al. (2011), who noted that while gamification can enhance engagement, its effectiveness heavily depends on the context and implementation. Interviews revealed that teachers using gamification, such as T007 and T003, observed increased student engagement but faced challenges such as classroom management (Gee, 2003; Hamari et al., 2014). This observation supports Gee's (2003) theory that while gamified learning environments can be highly engaging, they also demand more sophisticated classroom management strategies. The discussion emphasized adapting gamification to different learning styles, with T001 advocating a mix of physical and virtual formats to cater to different abilities and T010 implementing smaller group activities to effectively manage classroom dynamics. This finding is consistent with Plass et al. (2015) and Hamari et al. (2014), who argue that the successful implementation of gamification requires careful planning and a flexible approach to meet diverse learner needs.

#### 4. Conclusion

The analysis of Grade 1 students' vocabulary acquisition reveals a significant gap between their vocabulary levels and the YCT Level 2 benchmark, indicating that the average vocabulary size is considerably lower than the expected 150 words. This disparity underscores the urgent need to enhance teaching strategies to help students reach the required proficiency levels. The study also highlights individual differences in performance and lexical accuracy, with numerical terms being the most accurate and adjectives posing the greatest challenge. These findings suggest that educators should prioritize improving students' understanding and use of adjectives while maintaining their strength in numerical vocabulary. Educators who adopted a gamified approach reported increased student engagement and improved learning outcomes, despite facing challenges in classroom management and inclusion. Conversely, teachers who prefer traditional methods stress the importance of aligning teaching with standardized testing frameworks. Overall, gamification emerges as a promising strategy to promote vocabulary acquisition and boost student engagement. However, its effective implementation demands careful planning, adaptation to diverse learning styles, and ongoing evaluation to ensure alignment with educational objectives.

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