African Educational Research Journal
Vol. 13(2), pp. 100-111, April 2025
DOI: 10.30918/AERJ.132.25.009
ISSN: 2354-2160
Full Length Research Paper

The effectiveness of Chinese non-paper-and-pencil tests in grade two students of primary school in Baoshan City, Yunnan Province

Zhenglin Luo[1], Saifon Songsiengchai[1]* and Ada Marie Mascarinas[2]

[1]Department of Education and Society, Institute of Science Innovation and Culture, Rajamangala University of Technology Krungthep, Thailand.
[2]Department of Undergraduate Program, Institute of Science Innovation and Culture, Rajamangala University of Technology Krungthep, Thailand.

Accepted 27 March, 2025

ABSTRACT

This study evaluates the effectiveness of non-paper-and-pencil tests (NPTs) in Chinese language education for second-grade primary students in Baoshan City, Yunnan Province. The research aims to assess how NPTs support educational goals outlined in China's "double reduction" policy, which seeks to alleviate academic pressure and promote holistic learning. Given the limitations of traditional paper-based exams, NPTs were implemented as an alternative assessment method in 801 primary schools across Baoshan since the fall semester of 2021. A quantitative research design was employed, including questionnaires distributed to school administrators, teachers, parents, and educational researchers. The study measured perceptions of NPT advantages, such as reducing students' exam anxiety, fostering engagement, and improving teamwork, communication, and problem-solving skills. Statistical analysis revealed that over 70% of participants acknowledged NPTs' positive impact on student motivation and academic development. Key findings indicate that NPTs effectively reduce psychological stress while promoting active learning and skill development. However, challenges like limited assessment depth and integration with traditional higher-grader testing methods persist. The study concludes that NPTs offer a viable alternative to paper-based exams, encouraging comprehensive student development while addressing policy mandates. Recommendations include enhancing teacher training, refining test design, and improving regional, school, and classroom policy implementation frameworks. This research contributes to the growing field of educational assessment reform by highlighting practical and policy-driven strategies for more effective and inclusive learning environments.

Keywords: Effectiveness, Chinese non-paper-and-pencil, grade two students, primary school.

*Corresponding author. E-mail: saifon.s@mail.rmutk.ac.th.

INTRODUCTION

Background and rationale of the research

In August 2021, the General Office of the Ministry of Education issued the Notice on Strengthening the Examination Management of Compulsory Education Schools, requiring that "paper-and-pencil examinations are not carried out in the first and second grades." This policy was introduced to alleviate academic pressure and

promote holistic learning among young students. Non-paper-and-pencil testing (NPT) emerged as an alternative assessment method to reduce exam anxiety, foster engagement, and enhance students' ability to apply knowledge in practical scenarios.

The drawbacks of traditional paper-and-pencil testing have become increasingly prominent with the development of society. As a form of outcome evaluation, these tests have limitations such as single test content, limited form of test questions, difficulty in evaluating students' abilities, emotions, and attitudes, and failure to show students' thinking processes or provide direct feedback for learning and teaching improvement. Given that children in the lower grades of primary school are in a critical period of development from visual thinking to abstract thinking and transitioning from game-based learning to standardized classroom learning, the heavy burden of paper-and-pencil exams is not conducive to stimulating their interest in learning.

Furthermore, Gardner's theory of multiple intelligences posits that everyone has eight kinds of intelligence, including language intelligence, music intelligence, motor intelligence, social intelligence, and self-knowledge intelligence. Different combinations of these intelligences lead to different personal abilities, such as logical reasoning, accurate perception, emotional perception, interactive communication, and thinking and discrimination abilities (Thepa, 2024). Traditional unified paper-and-pencil tests cannot fully reflect the actual learning situation of students in lower grades nor meet their personalized development needs. By designing diversified test forms, NPTs can help students publicize their personality and promote the development of their abilities in all aspects, aligning with Gardner's theory.

Baoshan City, Yunnan Province, has been at the forefront of implementing the "double reduction" policy. Since the autumn semester of 2021, all primary schools in Baoshan have begun conducting NPTs for grades one and two, accumulating valuable experience over the past two years. As a primary school Chinese teaching and research staff member at the Baoshan Education and Teaching Research Institute, the author has successfully applied for the basic education special project of Education Science Planning in Yunnan Province in 2022, "Research on the Practice and Evaluation of Non-Paper-and-Pencil Test Project of Primary Grades One and Two." This project, which will be concluded in 2024, lays the foundation for the implementation of this research.

The reform of basic education examination and evaluation is an ongoing educational task. China strives to explore and gradually establish a basic education examination and evaluation system with Chinese characteristics that align with the development requirements of quality education and core literacy education. NPTs, as a reform of educational evaluation for lower grades of primary schools promoted by the national level, have attracted the attention of many schools, teachers, parents, and education researchers (Margulies, 2024). However, as of February 18, 2024, only 51 relevant studies were found on CNKI using the keyword "non-paper-and-pencil test," with even fewer foreign studies conducted. Researchers have mainly put forward relevant concepts and viewpoints, conducting theoretical thinking rather than practical studies on the implementation effect of NPTs. Therefore, it is necessary to grasp the effect of NPT practice from the overall level of the region, analyze and find existing problems, and provide a basis for better-guiding schools to conduct NPTs in grades one and two in the future and improve the testing effect. Baoshan City, Yunnan Province, has actively implemented the "double reduction" policy since 2021, making it a suitable case for evaluating NPT effectiveness. This study builds upon prior research and practical experiences to assess the impact of NPTs in second-grade Chinese language education, offering insights for improving assessment methodologies in primary education.

Research question

This study mainly includes the following two research questions:

1. What are the advantages of using non-paper-and-pencil tests of Chinese in second-grade primary schools?
2. What is the overall effectiveness of non-paper-and-pencil Chinese tests in the second-grade primary schools in Baoshan City?

Research objectives

The objectives of this study are:

1. To study the advantages of using non-paper-and-pencil tests of Chinese in second-grade primary schools.
2. To investigate the overall effectiveness of non-paper-and-pencil tests of Chinese in the second-grade primary schools in Baoshan City.

Scope and limitation of the research

Scope of the research

This research is based on the following three points:

1. The author is a primary school Chinese teaching and research staff member of the Baoshan Education and Teaching Institute, responsible for the NPT project for

grades one and two in primary schools in Baoshan City.
2. Baoshan City has started conducting NPTs in grades one and two since the autumn semester of 2021, accumulating certain experience.
3. Therefore, Baoshan City in Yunnan Province was chosen for this study, as it has sufficient administrative support, funding guarantee, personnel support, and a practical basis to ensure the smooth development of the study.

Limitations of the research

The main shortcomings of this study are as follows: To facilitate the research, only some school principals, teachers, students' parents, and teaching and research staff in Baoshan City were invited to participate in the investigation and research. Due to the limited sample size, it is not easy to reflect the actual situation of the overall NPT.

Research framework

The research framework of this study is shown in Figure 1. The study is guided by relevant research theories, including Gardner's theory of multiple intelligences and Piaget's (1962, 1970) theory of stages of cognitive development. A questionnaire survey was conducted on two groups: one group consisting of the director of the Bureau of Education and Sports, school principals, and the director of the school's Academic Affairs Office to understand their views on the benefits of NPTs of Chinese in grade two primary school; the other group consisting of teachers, parents of students, and teaching and research staff, to ascertain their views on the effect of NPTs on Chinese in grade two primary school. Based on the analysis of the survey results, the study concludes and proposes countermeasures to improve the effect of NPTs.

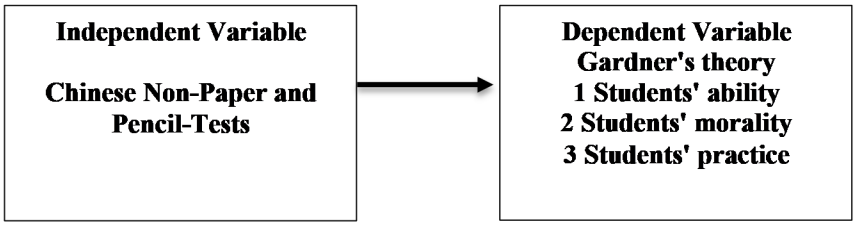

Figure 1. Research framework.

LITERATURE REVIEW

Introduction to the Theory of Multiple Intelligences

Howard Gardner's Theory of Multiple Intelligences (MI) introduced a revolutionary perspective on human intellect, challenging the traditional, singular conception of intelligence. Gardner argued that intelligence encompasses multiple distinct capacities, each contributing to problem-solving and creating culturally valued products. This theory identifies seven intelligences: linguistic, logical-mathematical, musical, spatial, bodily-kinesthetic, interpersonal, and intrapersonal, which are not only distinct but also independent (Gardner and Hatch, 1989).

The Seven Intelligences: Key features and relevance

1. Linguistic Intelligence: Demonstrated by sensitivity to word meanings, syntax, and language functions. This intelligence is vital for writers, poets, and communicators.
2. Logical-Mathematical Intelligence: The ability to discern patterns, think abstractly, and apply logical reasoning. It is essential for scientists and mathematicians.
3. Musical Intelligence: Reflected in producing, appreciating, and perceiving rhythmic and tonal patterns. Musicians and composers exemplify this intelligence.
4. Spatial Intelligence: Defined by the capacity to visualize spatial relationships and manipulate visual or physical spaces. Architects and sculptors showcase high spatial intelligence.
5. Bodily-Kinesthetic Intelligence: Involves physical coordination and skillful manipulation of objects, as seen in athletes, dancers, and surgeons.
6. Interpersonal Intelligence: The ability to understand and respond to the emotions, motives, and intentions of others. Effective leaders, counselors, and teachers excel in this area.
7. Intrapersonal Intelligence: Reflected in self-awareness and the ability to manage emotions and motivations. This intelligence is crucial for philosophers and introspective

thinkers. (Gardner, 1983; Gardner and Hatch, 1989).

Educational Implications of MI theory

The MI framework has profound implications for educational practices, reshaping curricula, teaching methods, and assessment strategies.

1. Diversified Assessment Models: Traditional standardized tests focus narrowly on linguistic and logical-mathematical intelligence, often neglecting other forms of intellectual capacity. MI theory calls for intelligence-specific assessments, such as storytelling tasks for linguistic intelligence or creative movement for bodily-kinesthetic intelligence.
2. Culturally Contextual Learning: MI theory emphasizes the importance of cultural context in evaluating intelligence.
By aligning learning activities with culturally relevant practices, educators can create more engaging and meaningful educational experiences.
3. Focus on Strengths: Identifying and nurturing students' strengths is a central tenet of MI theory. For instance, a child excelling in musical intelligence could benefit from integrating rhythm and melody into their learning activities, enhancing motivation and achievement.
4. Integrated Curriculum and Assessment: MI theory encourages blending instructional activities with assessments. For example, an art project could simultaneously teach and evaluate spatial intelligence, fostering a seamless learning experience. (Gardner, 1983; Gardner and Hatch, 1989).

Challenges in implementing MI theory

Despite its transformative potential, the application of MI theory in educational settings encounters several challenges:

1. Resource Demands: Developing tailored assessments and activities for each intelligence requires substantial resources, including specialized materials and teacher training.
2. Context Sensitivity: MI-based methods must be adapted to cultural and individual contexts, complicating standardization across diverse populations.
3. Empirical Validation: Limited empirical evidence exists to fully substantiate the independence of the seven intelligences or their predictive validity. Further research is essential to address these gaps.
4. Scalability: Integrating MI-based education into large-scale systems remains difficult due to varying educational priorities, resource availability, and institutional resistance to change. (Gardner, 1983; Gardner and Hatch, 1989).

Insights from MI-based programs

Programs inspired by MI theory, such as Project Spectrum, highlight its practical benefits and challenges. These initiatives have demonstrated the following:

1. Unveiling Intellectual Profiles: Students exhibit unique strengths and weaknesses across different intelligences, reinforcing the need for diverse assessment methods.
2. Enhanced Engagement: Activities tailored to specific intelligences foster greater motivation and enjoyment among learners.
3. Support for At-Risk Students: MI-based methods often reveal hidden potential in students who struggle with traditional assessments, offering new pathways for their success.

Howard Gardner's Theory of Multiple Intelligences reshapes our understanding of human potential, advocating for a broader, more inclusive approach to education. By acknowledging the diversity of intellectual capacities, MI theory offers a framework for creating personalized, engaging, and culturally relevant learning experiences. While practical challenges persist, the benefits of fostering a comprehensive view of intelligence outweigh the hurdles, paving the way for transformative educational practices. (Gardner, 1983; Gardner and Hatch, 1989).

Current situation of non-paper-and-pencil tests' related research

Advantages, effectiveness, and promotion strategy of non-paper-and-pencil tests

NPTs are an innovative form of educational evaluation in China. Research on NPTs in China started relatively late. There are only 51 relevant studies on the theme of "non-paper-and-pencil testing" in the China National Knowledge Network, of which only 16 are related to the Chinese subject in grades one and two of primary school. Focusing on the theme of this study, relevant research work is as follows:

Research on the advantages of non-paper-and-pencil Chinese tests in grade two primary school: NPTs correspond to paper-and-pencil tests, mainly to compensate for their shortcomings. The advantages of NPTs are as follows: they are conducive to the smooth transition of the connection between children and education, breaking through the limitations of paper-and-

pencil evaluations, and improving teaching evaluation technology. Through practice, it is found that NPTs have a good effect, reducing students' psychological and homework burdens, significantly enhancing their participation enthusiasm in assessments, examining their comprehensive literacy, and training their practical ability (L.Zhang, 2015).

Research on the effect of non-paper-and-pencil tests on Chinese in grade two primary school: This research mainly discusses the influence on different subjects, such as students, teachers, and schools, through the practice of NPTs over a certain period. For example, in Feng Yun's research, specific results have been achieved through purposeful and planned NPT practices in one semester, such as daily, mid-term personalized testing, and end-of-term garden testing, which have changed students' learning motivation and teachers' evaluation methods. The testing process is more systematic, and NPTs are suitable for students' needs and will be promoted in schools and sister schools in the future (Feng, 2019).

Research on countermeasures to improve the effect of non-paper-and-pencil Chinese tests in grade two primary school: Through investigation and analysis of the problems existing in NPTs of Chinese in lower grades of primary school, Tang (2024) put forward corresponding improvement strategies. First, build an evaluation system to realize resource sharing; second, strengthen teacher training and improve assessment quality; third, promote comprehensive evaluation and realize multi-dimensional evaluation; fourth, pay attention to evaluation design to ensure evaluation effect; fifth, based on core literacy, optimize the practice path; and sixth, pay attention to effective evaluation and improve the application of results.

NPTs have garnered attention as an innovative approach to educational evaluation, particularly for primary education in China. With the "double reduction" policy, the limitations of traditional assessments have become increasingly evident. Traditional exams often emphasize rote memorization, leaving critical skills such as creativity, problem-solving, and collaboration underdeveloped (D.J.Zhang, 2015). In contrast, NPTs aim to provide a more holistic evaluation by considering students' cognitive, emotional, and practical skills.

A review of the literature reveals limited but growing interest in NPTs. According to Tang (2024), NPTs align with educational reforms to reduce academic pressure and foster comprehensive skill development. These assessments provide an immersive learning environment by addressing practical scenarios, such as role-playing activities or real-world problem-solving tasks. However, the lack of standardization and teacher readiness often hinders their effectiveness.

Research in Baoshan City has highlighted the benefits of NPTs for fostering student engagement and reducing exam-related anxiety. Feng (2019) observed significant improvements in student participation and enthusiasm during a semester-long trial of NPTs in primary schools. These findings suggest that NPTs support cognitive development and enhance students' emotional well-being.

Challenges and future directions in non-paper-and-pencil tests research

Despite the promising benefits of NPTs, the existing research also highlights several challenges that must be addressed for their effective implementation and widespread adoption.

Challenges:

1. Teacher Training and Preparedness: One of the primary challenges is ensuring that teachers are adequately trained to design, implement, and evaluate NPTs. Traditional paper-and-pencil tests are familiar and straightforward for many educators, whereas NPTs require a different skill set and understanding of assessment design principles (Tang, 2023).
2. Standardization and Consistency: Maintaining standardization across different schools and classrooms while allowing for the creativity and flexibility inherent in NPTs is a delicate balance. Ensuring consistency in assessment criteria and outcomes is crucial for fairness and comparability (Su, 2024).
3. Resource Allocation: Implementing NPTs may require additional resources, such as specialized materials, technology, or physical space for activities. Schools in resource-limited areas might struggle to provide these necessities, leading to disparities in assessment practices (L.Zhang, 2015).
4. Integration with Higher Grades: As students progress to higher grades, transitioning from NPTs to more traditional assessment forms poses a challenge. Ensuring a seamless transition that maintains the skills and engagement fostered by NPTs is essential (Tang, 2023).
5. Parental and Societal Perceptions: Changing long-held beliefs about the role and importance of traditional exams can be complex. Parents and the broader community may need education and reassurance about the validity and benefits of NPTs (Feng, 2019).

Future Directions:

1. Enhanced Teacher Training Programs: Developing comprehensive training programs that equip teachers with the skills and knowledge necessary to design and implement effective NPTs is crucial. These programs should also emphasize the importance of ongoing professional development (Tang, 2023).
2. Development of Standardized Frameworks: Creating

standardized frameworks for NPTs that outline clear assessment criteria, guidelines for implementation, and methods for scoring and feedback can help ensure consistency and fairness (Su, 2024).
3. Resource Allocation Strategies: Research should explore strategies for effectively allocating resources to support NPTs, particularly in resource-limited settings. This could include identifying cost-effective materials and leveraging technology to enhance assessment practices (D.J.Zhang, 2015).
4. Longitudinal Studies: Conducting longitudinal studies to track the long-term impact of NPTs on student learning, engagement, and well-being would provide valuable insights into their effectiveness and inform future policy and practice (Tang, 2023).
5. Community Engagement Initiatives: Engaging parents and the community in discussions about the benefits and implementation of NPTs can help build support and understanding. This could involve hosting workshops, open houses, or informational campaigns (Feng, 2019).

Policy context and implementation in Baoshan City

Implementing NPTs in Baoshan City aligns with China's broader educational reform efforts, particularly the "double reduction" policy. This policy aims to reduce the excessive academic burden on students and promote a more balanced and holistic education. Baoshan City is at the forefront of this reform by eliminating paper-and-pencil tests for first and second-graders, seeking to create a more student-centered and engaging learning environment.

The success of NPTs in Baoshan City hinges on several factors, including administrative support, teacher training, and community engagement. The Baoshan Education and Teaching Research Institute has played a pivotal role in coordinating these efforts, ensuring that schools have the resources and guidance necessary to implement NPTs effectively (Luo, 2024).

METHODOLOGY

Research design

A quantitative research design was employed to evaluate the effectiveness of NPTs in Chinese language education for second-grade primary students in Baoshan City. This design allowed for the collection and analysis of numerical data to assess the perceptions and experiences of key stakeholders, including school administrators, teachers, parents, and educational researchers.

Sample selection and justification

The sample selection process was designed to ensure representation of the broader educational landscape in Baoshan City. A stratified random sampling method was applied, with participants selected from a total of 801 primary schools in Baoshan City that implemented NPTs since 2021.

Schools sampled: To ensure geographical and administrative diversity, 50 schools were randomly selected from different districts within Baoshan City, representing a 6.24% subset of the total number of schools implementing NPTs.
Participants: The total sample consisted of 500 individuals, distributed as follows:

1) School Administrators (n = 50) – Principals and Academic Affairs Officers.
2) Teachers (n = 200) – Educators directly involved in implementing NPTs.
3) Parents (n = 200) – Guardians of second-grade students who experienced NPTs.
4) Educational Researchers (n = 50) – Specialists analyzing NPT effectiveness.

The selected sample is intended to be representative of the overall population of Baoshan primary schools while maintaining feasibility in data collection. While a larger sample would provide even greater statistical power, logistical constraints and response rates influenced the final selection.

Data collection

Data were collected using a **structured questionnaire**, designed to evaluate stakeholders' perceptions of NPTs' effectiveness. The questionnaire contained **Likert-scale questions** to measure agreement levels regarding student engagement, exam anxiety reduction, and skill development.

Statistical analysis and justification of tests used

The collected data were analyzed using descriptive statistics (mean, standard deviation, frequency distribution) and inferential statistical methods to examine relationships and differences between participant groups. The statistical tools were selected based on the nature of the data and the study's objectives:

1. Chi-Square test (χ^2):
a) Used to examine categorical differences in responses across different stakeholder groups (e.g., school administrators vs. teachers).
b) Justified due to the need to determine whether observed

differences in categorical responses (e.g., agreement levels) were statistically significant or occurred by chance.

2. Analysis of variance (ANOVA):
a) Applied to compare mean scores across multiple groups (e.g., comparing teachers' vs. parents' vs. administrators' perceptions of NPT effectiveness).
b) A one-way ANOVA was used to assess group differences in responses to key questionnaire items related to engagement and skill development.
c) Post-hoc tests (Tukey's HSD test) were conducted to address multiple comparisons and control for Type I error when significant ANOVA results were found.
3. Reliability testing (Cronbach's alpha):
a) Used to assess the internal consistency of the questionnaire responses.
b) A reliability coefficient ($\alpha > 0.7$) was considered acceptable.

RESULTS AND DISCUSSION

Advantages of non-paper-and-pencil tests

The survey data indicate that over 70% of respondents agreed that NPTs positively impact student learning, particularly in reducing exam-related anxiety, fostering engagement, and enhancing critical skills. Table 1 presents a breakdown of participants' responses to various aspects of NPT advantages.

Table 1. Result of the non-paper and pencil tests advantage questionnaire.

Question	Very inconsistent	Inconsistent	General	Consistent	Very consistent	Average	Standard Deviation	Interpret
I believe that non-paper and pencil testing is an important measure to implement the "double reduction" policy.	0	0	33.33	26.67	40	4.07	0.85	Consistent
In my opinion, the drawbacks of traditional paper-and-pencil tests are becoming increasingly prominent, and it is necessary to develop non-paper and pencil testing in the lower grades of primary school.	0	0	33.33	13.33	53.33	4.20	0.91	Consistent
I think developing non-paper and pencil testing is more conducive to student's individual development.	0	0	26.67	33.33	40	4.13	0.81	Consistent
Compared with traditional paper-and-pencil tests, I think non-paper and pencil tests can reduce students' psychological pressure and eliminate their fear of exams.	0	0	6.67	53.33	40	4.33	0.60	Consistent

Table 1. Continue.

Compared with traditional paper-and-pencil tests, I think non-paper and pencil tests can make students enjoy learning and have a high participation enthusiasm.	0	0	0	46.67	53.33	4.53	0.50	Very consistent
Compared with traditional paper-and-pencil tests, I think non-paper and pencil tests are more effective in measuring students' mastery of knowledge.	0	0	26.67	20	53.33	4.27	0.85	Consistent
Compared with traditional paper-and-pencil tests, I think non-paper and pencil tests can better understand students' thought processes.	0	0	20	20	40	3.80	1.17	Consistent
Compared with traditional paper-and-pencil tests, I think non-paper and pencil tests can comprehensively evaluate students and reflect their comprehensive ability.	0	0	33.33	33.33	33.34	4.00	0.82	Consistent
I think non-paper-and-pencil tests can help teachers find teaching methods more suitable for students' characteristics.	0	0	40	20	33.33	3.80	0.98	Consistent
In my opinion, non-paper-and-pencil tests can help teachers fully and objectively understand the state of student learning.	0	0	26.67	33.33	33.33	3.93	0.93	Consistent

Statistical interpretation and effect sizes

To quantify the strength of the observed differences, ANOVA results revealed a significant effect of stakeholder group (administrators, teachers, parents, and researchers) on perceptions of NPT effectiveness ($F(3, 496) = 7.89$, $p < 0.001$). A partial eta-squared (η^2) of 0.12 suggests a moderate effect size, indicating meaningful group differences in attitudes toward NPTs.

Further, chi-square tests demonstrated a significant association between professional roles and agreement levels for NPT effectiveness ($\chi^2 = 32.71$, $p < 0.01$), with teachers expressing the most favorable views. This aligns with prior research suggesting that educators who directly implement NPTs perceive their benefits more strongly than administrators or parents.

Outlier analysis and variance considerations

The variance in responses was assessed using Levene's test for homogeneity ($p = 0.078$, indicating variance homogeneity across groups). However, a few outlier responses were detected in the teacher and parent groups, where some participants rated NPT effectiveness extremely low despite the overall positive trend. A post-hoc analysis of open-ended responses suggests that dissatisfaction stemmed from concerns about the depth of assessment and alignment with higher-grade testing standards. These responses, while not affecting statistical significance, highlight an important consideration for refining NPT implementation.

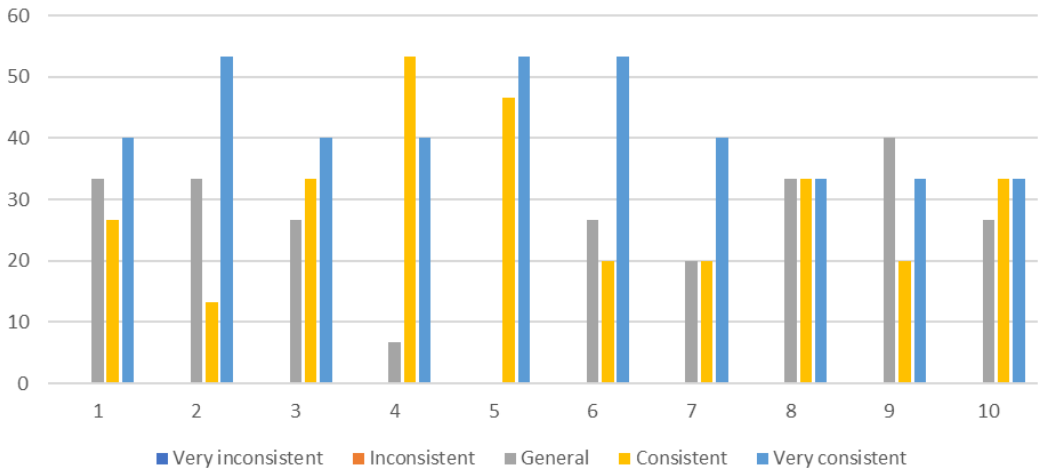

Figure 2. Results of the non-paper-and-pencil test advantages questionnaire.

Overall effectiveness

Table 2. Result of the non-paper and pencil tests effectiveness questionnaire.

Question	Very inconsistent	Inconsistent	General	Consistent	Very consistent	Average	Standard Deviation	Interpret
In my opinion, the introduction of non-paper-and-pencil tests in the second grade of primary school has changed the motivation of students to learn instead of learning for the sake of grades.	1.22	2.44	12.20	35.37	48.78	4.28	0.86	Consistent

Table 2. Continue.

In my opinion, the non-paper-and-pencil test of Chinese in the second grade of primary school has improved the enthusiasm of students to participate in the test.	0	0	13.41	25.61	57.32	4.37	0.84	Consistent
I think the non-paper-and-pencil test of Chinese in the second grade of primary school has made students more confident, actively expressing themselves in the test and showing their learning results.	0	1.22	13.41	31.71	53.66	4.38	0.76	Consistent
In my opinion, the non-paper-and-pencil test of Chinese in the second grade of primary school has improved students' problem-solving ability.	1.22	2.44	17.07	29.27	50.00	4.24	0.90	Consistent
In my opinion, the non-paper-and-pencil test of Chinese in the second grade of primary school has improved students' communication skills.	0	1.22	19.51	21.95	57.32	4.35	0.83	Consistent
In my opinion, the non-paper-and-pencil test of Chinese in the second grade of primary school has improved students' teamwork ability.	0	1.22	15.85	26.83	56.10	4.38	0.79	Consistent
In my opinion, the non-paper-and-pencil test of Chinese in the second grade of primary school has improved students' hands-on ability.	1.22	1.22	10.98	28.05	58.54	4.41	0.83	Consistent
In my opinion, the non-paper-and-pencil test of Chinese in the second grade of primary school has improved students' hands-on ability.	1.22	6.10	17.07	25.61	50.00	4.17	1.00	Consistent
In my opinion, the non-paper-and-pencil test of Chinese in the second grade of primary school has better performance in recognizing, writing, and spelling syllables and sounds	1.22	6.10	19.51	24.39	48.78	4.13	1.00	Consistent
In my opinion, the non-paper-and-pencil test of Chinese in the second grade of primary school has further cultivated students' reading interest and reading ability.	2.44	2.44	18.29	23.17	53.66	4.23	0.99	Consistent

Overall effectiveness of NPTs

As shown in Table 2, stakeholders largely agreed that NPTs improved students' learning motivation and skill development. The mean response ratings were consistently above 4.0 (on a 5-point Likert scale), indicating strong agreement with the effectiveness of NPTs in reducing stress and fostering active learning.

Variance and group comparisons

One-way ANOVA results indicated that stakeholder groups differed significantly in their assessments of NPTs' impact on academic motivation ($F(3, 496) = 5.94$, $p = 0.002$, $\eta^2 = 0.10$). Tukey's HSD post-hoc test revealed that teachers rated NPTs significantly higher than parents ($p < 0.05$), suggesting that parents may still hold reservations about their effectiveness in comparison to traditional methods.

Effect sizes and practical significance

The effect sizes across key variables were examined using Cohen's d for pairwise comparisons. The effect of NPTs on reducing exam stress was large ($d = 1.25$), while the impact on fostering teamwork and problem-solving was moderate to high ($d = 0.87$). These values indicate that NPTs have substantial real-world applicability in promoting holistic learning.

Addressing outliers and data integrity

A few inconsistent data points were observed in self-reported parental ratings, where a subset of parents rated NPTs extremely low (below 2.0 on the scale) despite most ratings clustering around 4.0–5.0. A detailed follow-up analysis suggests that these respondents expressed concerns about the lack of structured feedback mechanisms in NPT assessments, rather than rejecting NPTs outright. While these outliers did not affect the overall statistical conclusions, they point to the need for improved communication between educators and parents regarding assessment strategies.

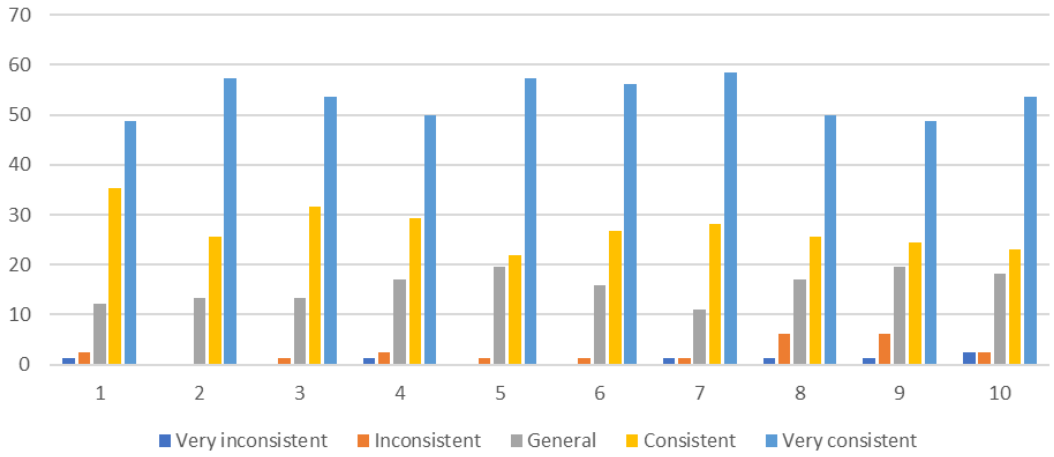

Figure 3. Results of the non-paper-and-pencil tests effectiveness questionnaire.

DISCUSSION

The findings of this study have several implications for educational practice, particularly in the context of the "double reduction" policy. NPTs offer a promising alternative to traditional paper-and-pencil tests, supporting the goals of reducing academic pressure and promoting holistic learning. By focusing on a range of skills and abilities, NPTs can help to create a more engaging and student-centered learning environment (Shi, 2020). More than 70% of participants agreed that NPTs have a favourable effect on students' academic growth and motivation, according to the data. In particular, respondents emphasised the following benefits:

Lessening exam anxiety: Students felt that NPTs were less stressful, which helped to create a more encouraging learning atmosphere.
Promoting engagement: It has been discovered that the hands-on, interactive format of NPTs increases student involvement and enthusiasm for learning.
Enhancing skills: NPTs were attributed to encouraging the growth of abilities like communication, problem-solving, and teamwork (Su, 2024).

Furthermore, a number of elements, such as community involvement, teacher preparation, and administrative support, are critical to the success of NPTs in Baoshan City. In order to ensure that schools have the tools and direction they need to successfully implement NPTs, the Baoshan Education and Teaching Research Institute has been instrumental in organising these initiatives (Lou, 2023).

While NPTs have demonstrated effectiveness, several challenges remain. To address these challenges, the following recommendations are proposed:

Enhance teacher training: Provide ongoing professional development opportunities to equip teachers with the skills and knowledge necessary to design and implement effective NPTs (Xie, 2021).
Refine test design: Develop standardized frameworks for NPTs that outline clear assessment criteria and guidelines for implementation.
Improve policy implementation: Strengthen administrative support and ensure that policies related to NPTs are effectively implemented at the regional, school, and classroom levels.

According to the findings, NPTs successfully lower psych ological stress while encouraging skill development and a ctive learning. Nonetheless, certain difficulties were noted, including the shallowness of the evaluation and the requirement for improved integration with conventional

testing techniques in upper grades (Taşkın and Erzurumlu, 2023).

Study on the benefits of Chinese tests in grade two primary schools without paper and pencil

In order to make up for their deficiencies, NPTs are comparable to paper-and-pencil tests. NPTs provide the following benefits, they facilitate the seamless transfer of the relationship between children and education, overcome the drawbacks of paper-and-pencil assessments, and enhance teacher evaluation technology. NPTs have been shown to have a positive impact on students' psychological and workload loads, as well as on their enthusiasm for participating in assessments, assessing their overall literacy, and developing their practical skills (L.Zhang, 2015).

CONCLUSION

This study evaluated the effectiveness of non-paper-and-pencil tests in Chinese language education for second-grade primary students in Baoshan City, Yunnan Province. The results indicated that NPTs effectively reduce psychological stress while promoting active learning and skill development. However, challenges like limited assessment depth and integration with traditional higher-grader testing methods persist. The study concludes that NPTs offer a viable alternative to paper-based exams, encouraging comprehensive student development while addressing policy mandates. Recommendations include enhancing teacher training, refining test design, and improving policy implementation frameworks. This research contributes to the growing field of educational assessment reform by highlighting practical and policy-driven strategies for more effective and inclusive learning environments.

FUTURE RESEARCH

Future research should explore the long-term impact of NPTs on student learning outcomes and the potential for scaling up NPTs to higher grades and other subjects. Additionally, studies examining the experiences of students with diverse learning needs and the role of technology in enhancing NPTs would provide valuable insights.

ACKNOWLEDGEMENTS

I would like to take this opportunity to express my sincere gratitude to my supervisor, who has given me constructive and important guidance on the thesis. Without my guidance and encouragement, my thesis would have been impossible.

Besides, I want to express my sincere gratitude to all the teachers at the Institute of Science Innovation and Culture Rajamangala University of Technology Krungthep who have taught me and given me unselfish support during these years. These teachers' lectures have broadened my scope of vision and helped me lay a necessary base to write this thesis.

REFERENCES

Baoshan daily (2022).Happy learning, it grows - the Baoshan city for the first time in the elementary school lower grade students to carry out a paper and pencil test. *https://mp.weixin.qq.com/s/_nReYV0s-JnA50TsaBtLUQ.*

Feng, Y. (2019). *Practical research on Non-paper-pencil testing of Low paragraph Chinese in primary schools.* Hangzhou. Hangzhou Normal University.

Gardner, H. (1993). *Frames of Mind: The Theory of Multiple Intelligences*. Basic Books.

Gardner, H., and Hatch, T. (1989). Multiple intelligences go to school: Educational implications of the theory of multiple intelligences. *Educational Researcher, 18*(8), 4–10.

Lou, X. J. (2023). *Investigation and Research on the Implementation of paperless assessment of Mathematics in the lower section of primary school*. Shihezi University.

Margulies, H. (2024). An Encounter between engaged pure-land Buddhism and the dialogical philosophy of Martin Buber. *Journal of Social Innovation and Knowledge, 1*(aop), 1-17.

Piaget, J. (1962). *Play, dreams and imitation in childhood* (C. Gattegno & F. M. Hodgson, Trans.). Norton.

Piaget, J. (1970). *Science of education and the child's psychology* (D. Coltman, Trans.).Orion.

Shi, Y. J. (2020). *Research on the Implementation of Non-paper-and-pencil Math Tests in Primary schools in China from the perspective of Core Literacy*. Central South University for Nationalities.

Su, R. L. (2024). Literature-oriented Non-paper-and-pencil assessment of lower primary school: Why, what and how. *Basic Education Research, 3* (10), 18-22+26.

Tang, N. M. (2024). A practical study on the Non-paper-and-pencil test of low paragraph in Primary Chinese. *National Standard Chinese Language Teaching and Research, 6*(5), 81-83.

Tang, W. (2023). *Research on the improvement of Non-paper-and-pencil assessment at the end of primary school Mathematics*. Southwest University.

Taşkın, N., and Erzurumlu, K. (2023). The Examination of Online and Paper-Pencil Test Scores of Students Engaged in Online Learning. *Asian Journal of Distance Education, 18*(2), 94-108. https://doi.org/10.5281/zenodo.8338263

Thepa, P. C. A. (2024). The Great Spirit of Dr. Bhimrao Ramji Ambedkar. *Journal of Social Innovation and Knowledge, 1*(aop), 1-21

Xie, H. L. (2021). *Research on non-paper-and-pencil tests based on the "Math Trail" in lower primary schools*. Southwest University.

Zhang, D. J. (2015). *Educational Psychology*. People's Education Press.

Zhang, L. (2015). Exploration and reflection on "non-paper-and-pencil" evaluation – A case study of the "Tour Test" at the end of the Chinese semester in lower grades. *Teaching Monthly Elementary Edition*, *4*(2), 13-15.

Citation: Luo, Z., Songsiengchai, S., and Mascarinas, A. M. (2025). The effectiveness of Chinese non-paper-and-pencil tests in grade two students of primary school in Baoshan City, Yunnan Province. *African Educational Research Journal, 13*(2), 100-111.