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STORYTELLING AND GAME-BASED LEARNING AS TOOLS FOR REINVIGORATING CHINESE CULTURAL EDUCATION IN PRIMARY SCHOOLS

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ABSTRACT
This research aims to 1) design and implement an instructional model integrating storytelling and game-based learning (GBL) for Chinese cultural education in primary schools, 2) evaluate its effectiveness in improving students' cultural knowledge, engagement, motivation, and satisfaction, and 3) analyze its impact on students' perceptions of social, national, and cultural identity. A quasi-experimental design was employed with 60 Grade 5 students (30 experimental, 30 control) from Yantan Middle School, Zigong City, China. The intervention was conducted over one semester (March-June 2025). Data collection included pre- and post-tests, observation checklists, reflection journals, semi-structured interviews, satisfaction questionnaires, and an AEP (Attention, Engagement, and Participation) survey. Quantitative data were analyzed using descriptive statistics and t-tests, while qualitative data were examined thematically. The results show that the experimental group achieved significantly greater cultural knowledge gains (Pre-test M = 58.4, Post-test M = 82.7; p < 0.001) than the control group. Student satisfaction was high (M = 4.56/5), particularly for enjoyment and preference over traditional instruction. AEP indicators also confirmed higher on-task behavior, participation, and self-reported engagement in the experimental group. Qualitative findings highlighted emotional connection, playful engagement, and cultural pride. The findings demonstrate that storytelling integrated with GBL can significantly improve cultural knowledge, engagement, and identity development among primary school students.
Keywords: Storytelling, Game-Based Learning, Cultural Education, Engagement, Primary Schools

INTRODUCTION

China's rich cultural heritage is deeply rooted in collective identity, filial piety (孝), and respect for authority, values that have historically shaped its education system. Traditional classroom practices have emphasized rote memorization and teacher-centered instruction, which are effective for transmitting factual knowledge but often insufficient in cultivating deep cultural understanding or long-term engagement. In today's globalized environment, young learners increasingly face distractions from digital media and global consumer culture, resulting in weaker connections to their cultural roots (Mu et al., 2024).

Storytelling offers a natural bridge between heritage and learning because of its deep roots in Chinese family life, where grandparents and elders commonly pass on folk tales, legends, and moral stories. This intergenerational practice provides continuity, empathy, and identity formation, making cultural learning feel authentic and personal (Chen & Wang, 2022). Likewise, game-based learning (GBL) provides interactive and playful pathways to cultural knowledge, aligning with students' digital habits while recontextualizing cultural narratives in modern forms. For example, the mythological action game Black Myth: Wukong demonstrates how traditional folklore like Journey to the West can be transformed into immersive, motivating experiences (Lau et al., 2024; Tang, 2023).

Integrating storytelling with GBL therefore not only engages learners emotionally and cognitively but also aligns with constructivist and sociocultural learning perspectives. Learner's co-construct meaning around cultural traditions through collaborative gameplay, narrative discussion, and problem-solving tasks. Recent studies confirm that digital storytelling and heritage games strengthen identity, motivation, and engagement in cultural classrooms (Camuñas-García et al., 2024; Zhou et al., 2024).

In this context, the present study seeks to revitalize cultural education by blending traditional narrative practices with interactive game design, ensuring both relevance and cultural continuity for Chinese primary school students. This approach provides a sustainable pathway to preserve cultural roots while making learning meaningful and enjoyable for the younger generation.

Research Questions

This study is designed to evaluate the effectiveness of integrating storytelling and game-based learning (GBL) in primary school cultural education, specifically through the following research questions: 1) How effective is the storytelling + GBL model in improving students' cultural knowledge and understanding? 2) How does the model influence students' engagement, motivation and overall satisfaction with learning? 3) How does it shape students' perceptions of cultural identity, social values, and national pride?

These questions systematically examine the impact of storytelling and GBL from three dimensions—academic learning outcomes, learner engagement, and cultural identity development—thereby providing empirical evidence and practical guidance for the innovative application of active learning strategies in cultural education, while also emphasizing inclusivity, sustainability, and long-term cultural preservation for diverse primary school learners.

Research Objectives

This research seeks to 1) design and implement a storytelling-GBL instructional model for Chinese cultural education; 2) evaluate its effectiveness on students' cultural knowledge; 3) assess students' engagement, motivation, and satisfaction; and 4) analyze its impact on students' perceptions of cultural identity and citizenship.

LITERATURE REVIEWS

Significance of Cultural Education in the Global Era

Chinese primary schools face the urgent challenge of helping young learners remain connected to their cultural roots in a fast-changing world. The rapid expansion of global media, entertainment, and consumer culture has created competing influences that often overshadow local traditions and practices. As a result, many young learners demonstrate limited knowledge of, and reduced appreciation for, their heritage. Preserving cultural identity among the younger generation has thus become a pressing challenge for educators and policymakers (Zhang, 2020). Without systematic efforts to foster cultural engagement, globalization may further accelerate the erosion of cultural traditions and weaken the continuity of cultural identity.

Traditional pedagogical approaches, particularly rote memorization and teacher-centered instruction, have not been effective in maintaining student interest in cultural subjects. While rote learning has historically been valued for its efficiency in transmitting factual knowledge, it often fails to stimulate curiosity, imagination, or personal connection to the material (Wu & Jiang, 2021). In the case of cultural education, such approaches reduce cultural traditions to abstract information to be memorized for examinations, rather than lived practices that shape identity and values. Consequently, many students perceive cultural subjects as tedious or irrelevant to their daily lives, leading to disengagement.

To revitalize cultural education, innovative pedagogical strategies are required approaches that not only deliver knowledge but also foster emotional connection and motivation. Storytelling has emerged as a powerful instructional tool for cultural education. Through narratives, learners can connect emotionally with cultural characters, values, and traditions. Storytelling allows abstract cultural concepts to be contextualized in relatable stories, thereby bridging the gap between past traditions and present experiences (Chen & Wang, 2022). For instance, legends about festivals such as the Dragon Boat Festival or the Mid-Autumn Festival not only convey historical origins but also provide opportunities for students to imagine themselves as part of a cultural continuum. Such narratives evoke empathy and identity, making culture feel alive and personally meaningful.

Complementing storytelling, game-based learning (GBL) provides an interactive framework that sustains learner engagement. Games introduce elements of challenge, competition, collaboration, and reward, which motivate learners to participate actively in the learning process. Research has consistently shown that GBL enhances motivation, attention, and retention of knowledge, particularly among younger students (Su & Cheng, 2021). In cultural education, games can transform traditional practices into interactive experiences. For example, role-playing games that simulate cultural rituals or competitive quizzes based on legends enable students to engage playfully while internalizing cultural knowledge. This transformation of learning into an enjoyable experience helps reduce the perception of cultural studies as monotonous.

Constructivist and Sociocultural Foundations of Storytelling and Game-Based Learning

The theoretical foundation of this study is grounded in constructivist learning theory, which provides a lens to understand how storytelling and game-based learning (GBL) enhance cultural education. The utilization of the principles of constructivist learning theory, which posits that learners construct knowledge actively through interaction and experience rather than passively receiving information (Vygotsky, 1978). Constructivist classrooms emphasize student-centered approaches, where learners are encouraged to explore, question, and collaborate. Storytelling supports constructivism by engaging learners in meaning-making processes, while GBL adds the dimension of active participation and problem-solving. Together, these approaches create a dynamic and immersive environment where cultural learning is not only cognitive but also affective and social.

Moreover, this integration aligns with sociocultural perspectives on learning, which highlight the role of social interaction and cultural tools in shaping knowledge. According to Vygotsky (1978), learning occurs most effectively within the Zone of Proximal Development (ZPD), where learners engage in collaborative tasks supported by teachers and peers. Storytelling sessions often involve shared listening, discussion, and retelling, while GBL activities promote teamwork and peer learning. These social interactions reinforce cultural values as collective experiences, thereby strengthening cultural identity.

The significance of implementing such approaches is profound. By combining storytelling and GBL, educators can transform cultural education from a passive, memory-based activity into an engaging, participatory, and identity-affirming experience. This dual strategy addresses both the cognitive and emotional dimensions of learning. Students not only acquire cultural knowledge but also develop pride in their heritage and a sense of belonging to a cultural community (Liu et al., 2021). Such outcomes are vital in ensuring that cultural traditions are transmitted effectively to the next generation, even amid global influences.

In conclusion, the challenge of preserving cultural identity among Chinese primary school students necessitates innovative pedagogical solutions. Storytelling and GBL, grounded in constructivist and sociocultural theories, provide a powerful combined approach to re-engage learners in cultural education. By fostering emotional connection, active participation, and collaborative learning, this integration offers a pathway to strengthen cultural engagement and cultivate lasting appreciation of heritage.

Storytelling, Game-based Learning, and Cultural Engagement

Storytelling and game-based learning (GBL) have been widely recognized as effective strategies to enhance student engagement and deepen cultural learning. Storytelling enables learners to connect emotionally with cultural narratives, bridging the gap between abstract traditions and personal experience. Scholars argue that storytelling enhances empathy, imagination, and cultural identity formation by immersing students in cultural contexts (Chen & Wang, 2022; Wu & Jiang, 2021).

GBL, on the other hand, leverages interactivity, challenge, and collaboration to foster motivation and active learning. Empirical studies have shown that GBL increases attention, knowledge retention, and intrinsic motivation (Su & Cheng, 2021). In cultural education, GBL transforms passive reception into participatory exploration, encouraging students to collaborate and internalize cultural practices through play (Nguyen et al., 2022).

The theoretical foundation of this study rests on constructivist and sociocultural learning theories. Constructivism highlights that learners actively construct knowledge through interaction and experience (Vygotsky, 1978). Sociocultural perspectives emphasize that learning occurs most effectively within collaborative contexts supported by peers and teachers. Together, storytelling and GBL provide a synergistic model that stimulates cognitive, emotional, and social engagement in cultural education.

RESEARCH METHODOLOGY

This study adopted a quasi-experimental design with pre- and post-tests to evaluate the impact of the storytelling and game-based learning (GBL) model on cultural education in primary schools. The design structure can be represented as follows:

Experimental Group: O1 → X → O2

O1 = Pre-test score (before intervention)

X = Storytelling + GBL intervention (one semester, March-June 2025)

O2 = Post-test score (after intervention)

Control Group: O1 → C → O2

O1 = Pre-test score (before intervention)

C = Traditional teacher-centered instruction

O2 = Post-test score (after instruction)

Participants were 60 Grade 5 students (aged 10-11) from Yantan Middle School, Zigong City, China. The population of Grade 5 students was approximately 500. A purposive sampling method was used to select two groups: 30 students in the experimental group and 30 in the control group. Instruments included: 1) A cultural knowledge test (100 points), 2) a student satisfaction questionnaire (5-point Likert scale), 3) a classroom observation checklist, 4) a reflection journals, 5) a Semi-structured interview, and 6) an AEP (Attention, Engagement, and Participation) survey, including a 10-item student self-report scale. Data analysis involved descriptive statistics, paired-sample and independent-sample t-tests for quantitative data, and thematic analysis for qualitative data.

RESEARCH RESULTS

To further evaluate the effectiveness of the intervention, pre- and post-test scores were compared between the experimental and control groups. This comparison highlights not only overall improvements but also the extent to which storytelling combined with game-based learning (GBL) outperformed traditional instruction.

Table 1 presents a comparison of pre- and post-test scores between the experimental group, which received the storytelling + game-based learning (GBL) intervention, and the control group, which followed traditional instruction. The experimental group (n = 30) achieved a pre-test mean of 58.4 (SD = 6.3) and a post-test mean of 82.7 (SD = 5.8), reflecting a substantial mean gain of +24.3 points. In contrast, the control group (n = 30) recorded a pre-test mean of 59.1 (SD = 6.1) and a post-test mean of 66.8 (SD = 6.5), with a comparatively smaller mean gain of +7.7 points. Statistical analysis confirmed these improvements, with the experimental group's t-value of 9.52 ($p < .001$) indicating a highly significant difference, while the control group's t-value of 2.88 ($p < .05$) showed only moderate gains. Both groups improved over the semester, but the experimental group demonstrated significantly greater progress, confirming the superior effectiveness of the storytelling + GBL model in enhancing cultural knowledge. These findings highlight the added value of innovative pedagogical approaches in comparison to conventional teaching methods.

Table 1 Comparison of Pre- and Post-Test Scores Between Experimental and Control Groups in Cultural Knowledge

Group	n	Pre-Test Mean (SD)	Post-Test Mean (SD)	Mean Gain	t-value	p-value
Experimental	30	58.4 (6.3)	82.7 (5.8)	+24.3	9.52	<0.001
Control	30	59.1 (6.1)	66.8 (6.5)	+7.7	2.88	<0.05

Both groups improved from pre- to post-test, but the experimental group achieved significantly greater gains (Pre-test M = 58.4, Post-test M = 82.7; p < 0.001). This indicates that the integration of storytelling and GBL had a stronger impact on cultural knowledge acquisition than traditional instruction.

Effectiveness of Storytelling + GBL Model

Attendance was higher in the experimental group (97% vs. 89%). Participation, collaboration, and cultural retention were also stronger compared to the control group. Teachers additionally reported greater enthusiasm, heightened curiosity, and increased cultural pride among students, indicating that the storytelling and GBL model effectively supported both academic and affective learning outcomes.

Students' Satisfaction

Table 2 presents the results of students' satisfaction with learning cultural education through storytelling and game-based learning (GBL). The findings reveal consistently high levels of

satisfaction across all dimensions, with overall satisfaction rated at M = 4.56 (SD = 0.44), interpreted as Very High. The highest satisfaction was reported for Preference over Traditional Methods (M = 4.8, SD = 0.3) and Enjoyment of Lessons (M = 4.7, SD = 0.4), both interpreted as Very High. This indicates that students found the storytelling + GBL model not only more enjoyable but also clearly preferable to conventional teacher-centered instruction. Similarly, Engagement & Motivation was rated Very High (M = 4.6, SD = 0.4), showing that the model successfully captured attention and encouraged active learning. Students also reported high levels of Cultural Understanding (M = 4.5, SD = 0.5) and Relevance to Daily Life (M = 4.2, SD = 0.6), suggesting that storytelling made cultural content more meaningful and applicable to their real-life experiences.

In summary, students were highly satisfied with this innovative approach, particularly valuing its enjoyment, motivational qualities, and superiority over traditional methods. These findings complement the quantitative test results by confirming that the model not only improved knowledge but also enhanced the effective and attitudinal dimensions of learning, reinforcing cultural pride and positive attitudes toward cultural education.

Table 2 Students' Satisfaction with Storytelling and Game-Based Learning (GBL) in Cultural Education

Dimension	Mean	SD	Interpretation
Enjoyment of Lessons	4.7	0.4	Very High
Cultural Understanding	4.5	0.5	High
Engagement & Motivation	4.6	0.4	Very High
Relevance to Daily Life	4.2	0.6	High
Preference over Traditional	4.8	0.3	Very High
Overall Satisfaction	**4.56**	**0.44**	**Very High**

Students reported high levels of satisfaction, particularly in enjoyment and preference over traditional methods. The integration of "Black Myth: Wukong", a game inspired by the legendary Chinese tale Journey to the West, made cultural learning especially powerful. By interacting with mythical characters, facing challenges, and exploring narratives drawn from traditional folklore, students experienced culture in an immersive and playful way. This gamified approach not only increased attention and motivation but also transformed cultural stories into lived experiences, deepening appreciation, curiosity, and pride in Chinese heritage. When cultural traditions are reimagined through modern games, they become both educational and inspiring, bridging the past with the present in a way that resonates strongly with young learners.

Qualitative Insights: findings reinforced the satisfaction results by revealing three recurring themes.

1) Emotional Connection - Students consistently described feeling immersed in the cultural stories, with many noting that storytelling allowed them to "see, hear, and imagine the traditions" vividly. This aligns with high satisfaction ratings for cultural understanding and relevance to daily life in the satisfaction table, showing that narratives helped students relate cultural knowledge to personal and family experiences.

2) Playful Engagement and Motivation - Boys often favored the competitive and interactive aspects of games, while girls expressed stronger enjoyment of storytelling elements. Both groups, however, highlighted that the combination of games and stories made learning fun and motivating. This complements the satisfaction results where enjoyment and motivation received some of the highest mean scores, confirming that gamified activities increased attention and participation.

3) Cultural Pride - Learners repeatedly expressed pride in Chinese traditions, connecting classroom activities with family practices such as celebrating festivals. This echoes the strong satisfaction results in cultural identity and overall satisfaction, suggesting that the storytelling and GBL model not only enhanced learning but also strengthened emotional ties to heritage. Together, these insights demonstrate that students' satisfaction ratings were not only statistical outcomes but also reflected lived experiences of emotional engagement, playful learning, and renewed pride in cultural identity.

Table 3 Students' Perceptions of Social, Nation, and Cultural Education

Indicator	Pre-Test Mean	Post-Test Mean	Difference	p-value	Interpretation
Historical Understanding	3.1	4.2	+1.1	<0.01	Significant improvement
Cultural Appreciation	3.5	4.6	+1.1	<0.001	Strong positive change
National Identity	3.8	4.7	+0.9	<0.01	Enhanced pride
Citizenship Attitudes	3.2	4.3	+1.1	<0.01	Improved cooperation

Table 3 presents the results of students' perceptions across four indicators: historical understanding, cultural appreciation, national identity, and citizenship attitudes. Across all dimensions, students showed significant improvement from pre-test to post-test, confirming the positive impact of the storytelling + GBL model on affective and civic outcomes. Historical Understanding increased from 3.1 to 4.2 ($p < .01$), a gain of +1.1, demonstrating that students developed a stronger grasp of historical contexts and the significance of cultural traditions. Cultural Appreciation rose from 3.5 to 4.6 ($p < .001$), also a gain of +1.1, representing the most pronounced shift. This indicates that integrating stories and games helped students not only learn cultural content but also value it more deeply. National Identity improved from 3.8 to 4.7 ($p < .01$), a gain of +0.9. This shows that the intervention enhanced students' pride in their cultural heritage and sense of belonging to the nation. Citizenship Attitudes increased from 3.2 to 4.3 ($p < .01$), a gain of +1.1, reflecting greater willingness to cooperate, participate, and take responsibility as members of society. Taken together, these results highlight that the storytelling + GBL model influenced not only cognitive learning but also affective and social dimensions. The significant gains across all four indicators demonstrate their potential to nurture cultural pride, civic responsibility, and deeper appreciation of heritage, complementing the quantitative knowledge improvements and high satisfaction scores reported earlier.

To complement the knowledge and satisfaction results, students' attention, engagement, and participation (AEP) were also evaluated to provide a comprehensive picture of classroom dynamics. AEP serves as a critical indicator of how actively and meaningfully students are involved in the learning process, reflecting not only cognitive focus but also behavioral participation and motivational factors.

For clarity, the results are presented in two parts. Table 4 reports on On-Task Behavior, highlighting the percentage of time students remained focused during lessons. Table 5 presents the remaining AEP indicators, including observer ratings, participation rate, student self-reports (AEP-10), and teacher ratings (AEP-T6). Together, these results allow for a detailed comparison of classroom attentiveness and engagement between the experimental and control groups.

Table 4 On-Task Behavior Results (Control vs. Experimental Groups)

Indicator	Control Mean (SD)	Experimental Mean (SD)	Mean Difference	*t*-value	*p*-value
On-Task %	72.3 (8.4)	89.7 (6.2)	+17.4	5.22	<0.001

Note. On-task percentage indicates the proportion of time students were observed staying focused during lessons.

On-task behavior was analyzed separately due to its unique percentage scale and its critical role in sustained attention. As shown in Table 4a, the experimental group maintained significantly higher on-task rates (M = 89.7, SD = 6.2) compared to the control group (M = 72.3, SD = 8.4). The mean difference of +17.4 percentage points was statistically significant (t = 5.22, p < .001), demonstrating that the storytelling and GBL model substantially improved students' ability to stay focused throughout the lesson.

Table 5 AEP Engagement and Participation Results (Control vs. Experimental Groups)

Indicator	Control Mean (SD)	Experimental Mean (SD)	Mean Difference	*t*-value	*p*-value
Observer Rubric (1-4)	2.4 (0.5)	3.6 (0.4)	+1.2	6.15	<0.001
Participation Rate (events/10 min)	1.8 (0.7)	3.9 (1.0)	+2.1	5.77	<0.001
Student AEP-10 (1-5)	3.1 (0.6)	4.4 (0.5)	+1.3	6.44	<0.001
Teacher Rating AEP-T6 (1-5)	3.0 (0.5)	4.5 (0.4)	+1.5	7.01	<0.001

Engagement and Participation Indicators.
Table 5 presents the remaining AEP indicators. Observer ratings revealed significantly higher engagement behaviors in the experimental group (M = 3.6, SD = 0.4) than in the control group (M = 2.4, SD = 0.5), with a gain of +1.2 points (*t* = 6.15, *p* < .001). Participation rates more than doubled, with experimental students contributing 3.9 events per 10 minutes compared to 1.8 for controls, a gain of +2.1 (*t* = 5.77, *p* < .001). Student self-reports (AEP-10) showed higher persistence and engagement (M = 4.4, SD = 0.5) compared to controls (M = 3.1, SD = 0.6), a mean difference of +1.3 (*t* = 6.44, *p* < .001). Finally, teacher evaluations (AEP-T6) rated experimental students higher (M = 4.5, SD = 0.4) than controls (M = 3.0, SD = 0.5), with a difference of +1.5 (*t* = 7.01, *p* < .001). Together, these findings confirm that storytelling and GBL significantly enhanced classroom engagement, participation, and motivation, complementing the gains in sustained attention highlighted.
The findings show that students in the experimental group were much more engaged than those in the control group. They stayed more focused, joined activities more often, and reported feeling more motivated and persistent. Teachers and observers also confirmed that students learning through storytelling and games were more active, enthusiastic, and responsive. Overall, these results clearly show that the storytelling + GBL model created a more lively, participatory, and motivating classroom environment compared to traditional teaching.
Student Engagement Survey (AEP-10)
Students' self-reported attention, engagement, and participation were evaluated using the AEP-10 scale. This 10-item Likert questionnaire (1 = Strongly Disagree, 5 = Strongly Agree) covered four key aspects of learning: behavioral, cognitive, affective, and social engagement. Table 6 presents the results of students' responses to the AEP-10 items.

Table 6 Students' Engagement and Participation Results Based on the AEP-10 Scale

Item	Statement	Mean	SD	Interpretation
1	I paid close attention during the lesson.	4.2	0.5	High
2	I tried different ways to understand difficult parts.	4.1	0.6	High
3	I enjoyed today's activities.	4.5	0.4	Very High
4	I felt curious about the topic.	4.3	0.5	High
5	I contributed ideas during discussions.	4.0	0.7	High
6	I asked questions when I did not understand.	3.9	0.8	Moderate-High
7	I worked well with my classmates.	4.4	0.5	Very High
8	I kept trying even when tasks were challenging.	4.2	0.6	High
9	I could explain what I learned in my own words.	4.1	0.5	High
10	I would like to learn this way again.	4.7	0.3	Very High

The results in Table 6 show overall high levels of student engagement with storytelling and game-based learning (GBL). The highest-rated items included "I would like to learn this way again" (M = 4.7, SD = 0.3) and "I enjoyed today's activities" (M = 4.5, SD = 0.4), both interpreted as Very High. These findings highlight strong affective engagement, showing that students not only enjoyed the learning process but also expressed enthusiasm for continuing with this method.

Collaborative and social engagement were also rated very positively. For example, "I worked well with my classmates" received a mean of 4.4 (SD = 0.5), while perseverance was reflected in "I kept trying even when tasks were challenging" (M = 4.2, SD = 0.6). These results align with the broader AEP findings, suggesting that the model fosters persistence and teamwork.

Cognitive engagement was also evident, with items such as "I could explain what I learned in my own words" (M = 4.1, SD = 0.5) and "I tried different ways to understand difficult parts" (M = 4.1, SD = 0.6) receiving consistently high ratings. The lowest mean was for "I asked questions when I did not understand" (M = 3.9, SD = 0.8), interpreted as Moderate-High, indicating that while students were attentive and motivated, some were less proactive in questioning.

Overall, the AEP-10 results confirm that the storytelling + GBL approach generated very high levels of student engagement, particularly in enjoyment, motivation, and willingness to continue learning this way, while also supporting collaboration and perseverance.

DISCUSSION & CONCLUSION

The findings align with constructivist learning (Zhou et al., 2024; Vygotsky, 1978): students actively built understanding through narrative meaning-making and interactive play rather than passive recall. They also reflect sociocultural perspectives (Camuñas-García et al., 2024), as cultural concepts were co-constructed through dialogue and collaboration, consistent with Vygotsky's Zone of Proximal Development (ZPD), where scaffolding and peer interaction support mastery of challenging cultural ideas.

In practice, storytelling provided conceptual scaffolds and shared reference points; GBL tasks prompted cooperative problem-solving, peer explanation, and immediate feedback. Observations of small-group discussions during gameplay showed how students negotiated meanings and applied cultural norms in context—evidence of ZPD processes at work.

While effective, implementation presents challenges: (a) teacher training in narrative design, facilitation, and game orchestration; (b) resource constraints (time, devices, age-appropriate titles); (c) stakeholder resistance to shifting away from exam-driven routines; and (d) learner variability—some students may prefer traditional approaches. These factors affect sustainability and scalability and should be addressed in planning and professional development.

Future studies should examine long-term sustainability across diverse schools, track retention over time, and test blended or digital delivery (e.g., VR/AR) to broaden access. Trials could compare different genres of cultural games and levels of teacher scaffolding to optimize engagement, inclusion, and equity of outcomes.

This study provides compelling evidence that integrating storytelling with game-based learning (GBL) is an effective instructional model for revitalizing cultural education in primary schools. Across knowledge tests, satisfaction surveys, perception measures, and AEP indicators, the experimental group consistently outperformed the control group, confirming that the approach was superior to traditional teacher-centered methods.

Knowledge Gains. Pre- and post-test results revealed substantial improvements in cultural knowledge for students taught with storytelling + GBL, with a mean gain of over 24 points compared to 7.7 points in the control group. This significant difference indicates that the model supported deeper comprehension and long-term retention of cultural content. Recent findings echo this outcome, with GBL consistently shown to produce higher knowledge gains than traditional instruction (Mu Zubair et al., 2024).

Satisfaction and Engagement. Students reported very high satisfaction, particularly in enjoyment, preference over traditional methods, and motivation to continue learning through this approach. These findings show that cultural education, when combined with interactive storytelling and game elements, becomes more relevant and appealing to learners. Recent large-scale reviews confirm that GBL substantially enhances motivation and affective engagement, particularly in early and primary education (Alotaibi et al., 2024). The use of Black Myth: Wukong further enhanced cultural engagement by blending traditional folklore with modern gameplay, transforming cultural content into lived experiences. This reflects broader evidence that digital storytelling and cultural games enhance both engagement and motivation in Chinese classrooms (Zhou et al., 2024).

Perceptions of Social, National, and Cultural Identity. Students demonstrated significant improvements in historical understanding, cultural appreciation, national identity, and citizenship attitudes. These affective outcomes highlight that the model not only improved academic learning but also strengthened civic values and cultural pride, addressing the broader goals of cultural education. Studies of digital heritage games confirm that embedding cultural narratives in interactive forms fosters pride, empathy, and stronger identity connections (Camuñas-García et al., 2024).

AEP Findings. Attention, engagement, and participation results provided multi-perspective confirmation of the model's effectiveness. The experimental group showed significantly higher on-task behavior, participation rates, and observer ratings, as well as more positive self-reports and teacher evaluations. Separating on-task behavior from other indicators revealed that the model was especially powerful in sustaining attention, a key factor for effective learning. Together, these findings demonstrate that storytelling + GBL created a lively, participatory, and motivating classroom environment.

Theoretical Implications. The findings align with constructivist learning theory, where knowledge is actively built through interaction and experience, and with sociocultural perspectives, which emphasize collaborative meaning-making within cultural contexts (Vygotsky, 1978). Recent work confirms that active, game-based methods align strongly with these theories, producing greater engagement, comprehension, and motivation compared to lecture-based instruction (Mu Zubair et al., 2024).

Practical Implications. Teachers can apply storytelling and games to make cultural content engaging and meaningful. Curriculum designers should consider embedding gamified storytelling into cultural modules, and policymakers can support training and resources to scale up such innovative models in primary education. The findings also suggest that integrating

digital storytelling and culturally relevant games can play a vital role in preserving heritage and nurturing identity among younger generations.

Limitations and Future Research. This study was limited to a small sample (n = 60) from one school, which may affect generalizability. Future research should replicate the study across multiple schools, use larger and more diverse samples, and explore longitudinal designs to assess lasting impacts. Further, incorporating emerging technologies such as virtual reality (VR) and augmented reality (AR) could expand immersive cultural experiences and increase learner engagement. For instance, recent VR studies integrating generative AI and eye-tracking have demonstrated the potential of immersive cultural learning to heighten attention and personalization (Lau et al., 2024).

In conclusion, the storytelling integrated with GBL model significantly improved students' cultural knowledge, engagement, satisfaction, and perceptions of identity and citizenship. By transforming cultural education from rote memorization into an active, meaningful, and enjoyable process, this approach offers a promising pathway for strengthening cultural appreciation and pride among primary school learners. Ultimately, it bridges traditional heritage with modern pedagogy, ensuring that cultural identity is preserved and celebrated in the next generation.

The research discovers that storytelling combined with game-based learning can effectively revitalize cultural education in Chinese primary schools. Beyond the measurable gains in cultural knowledge, engagement, and satisfaction, the approach also reaffirmed key cultural values of filial piety, collective identity, and respect for tradition. By weaving familiar narratives with interactive formats such as Black Myth: Wukong, students not only learned content but also developed pride in their cultural roots and a stronger sense of identity. These findings highlight that integrating heritage-based storytelling and modern GBL strategies provides a sustainable pathway to preserve Chinese cultural continuity while preparing students for the demands of creativity, collaboration, and critical thinking in a globalized world. Future work should continue to refine these strategies across diverse cultural contexts and explore their long-term impact on students' identity formation and educational outcomes.

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